The OIL WEEKLY

A Journal for
Oil and Gas Producers and Field Men

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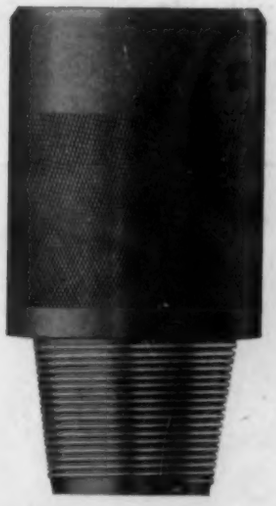

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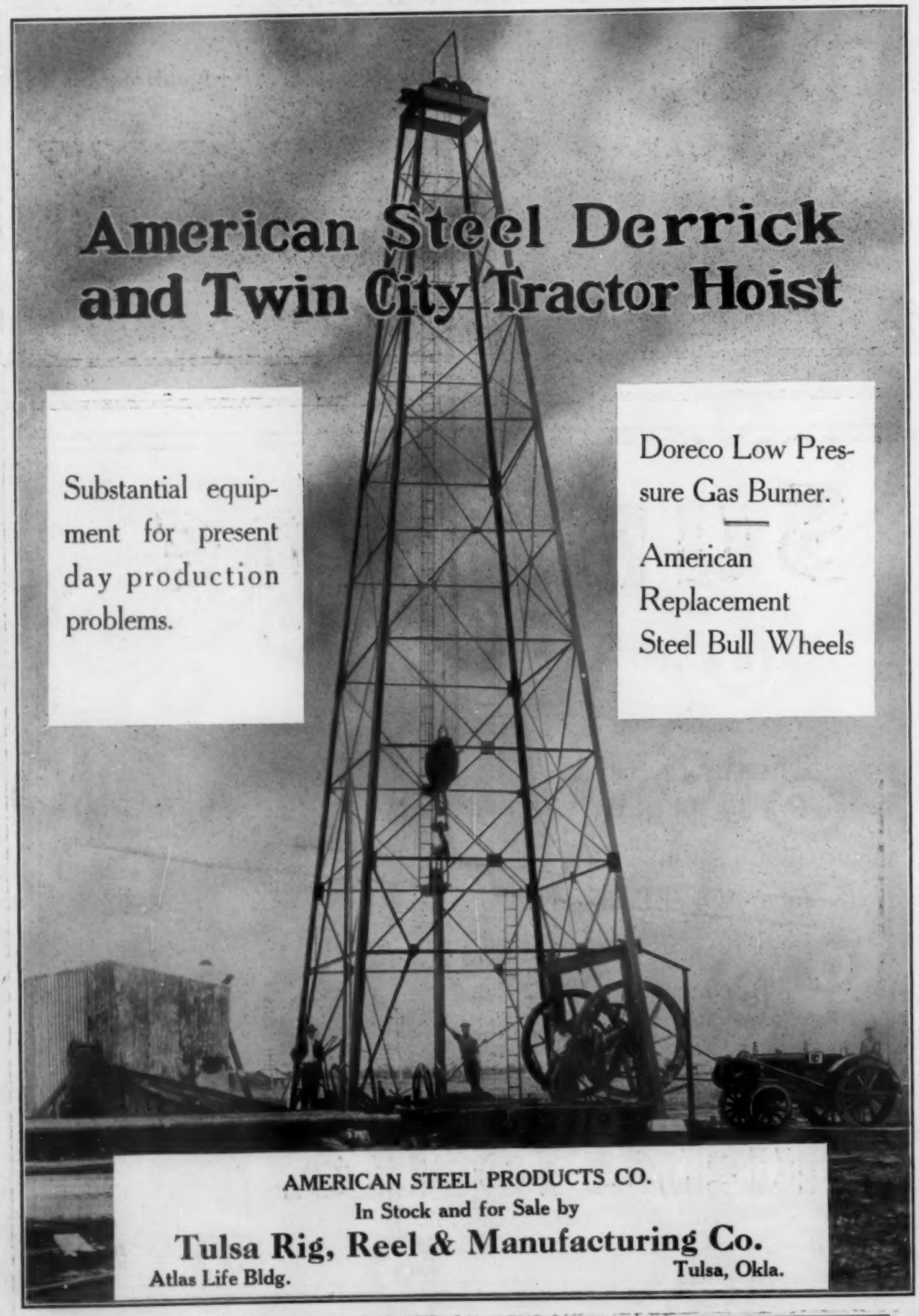
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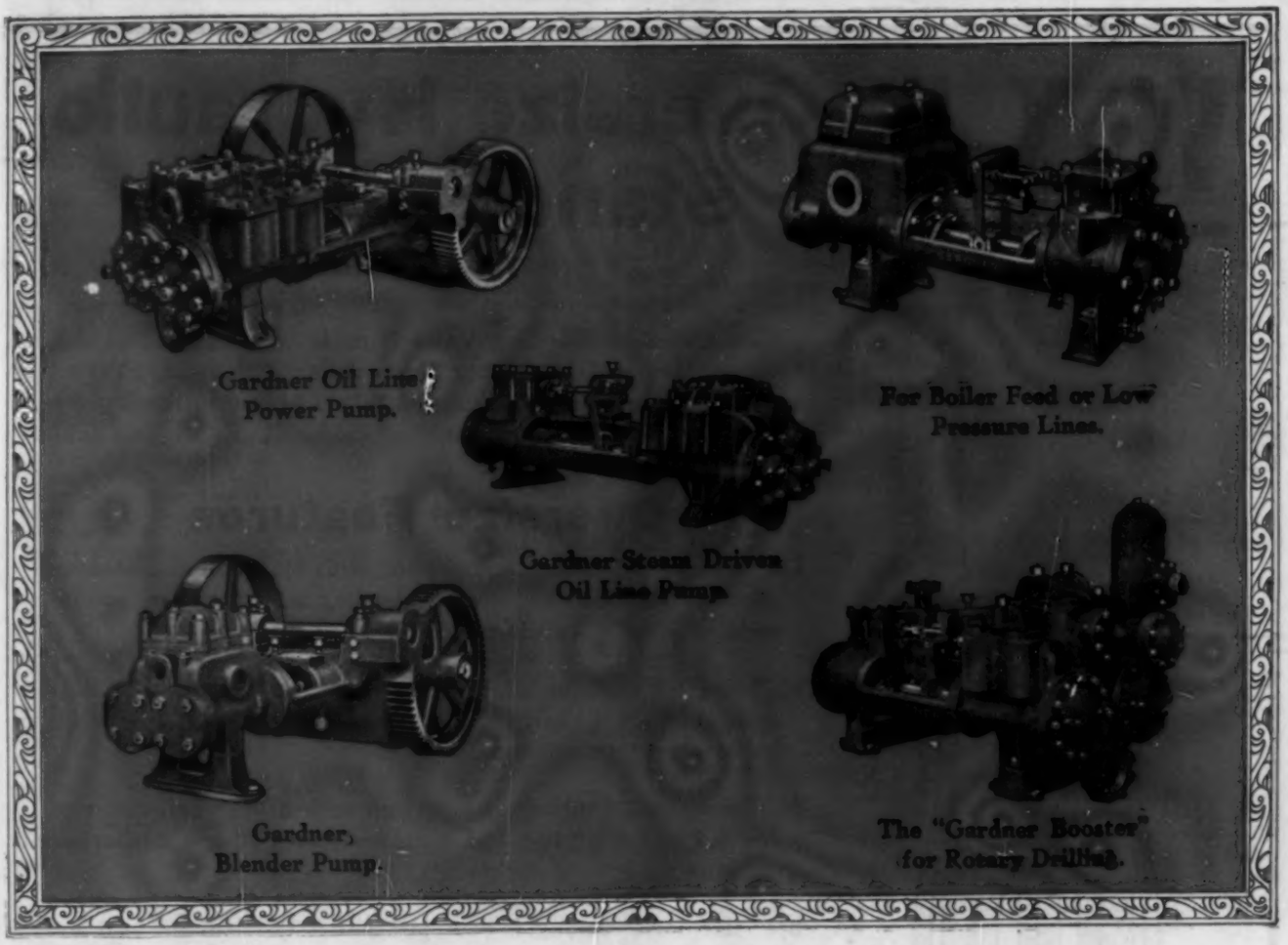
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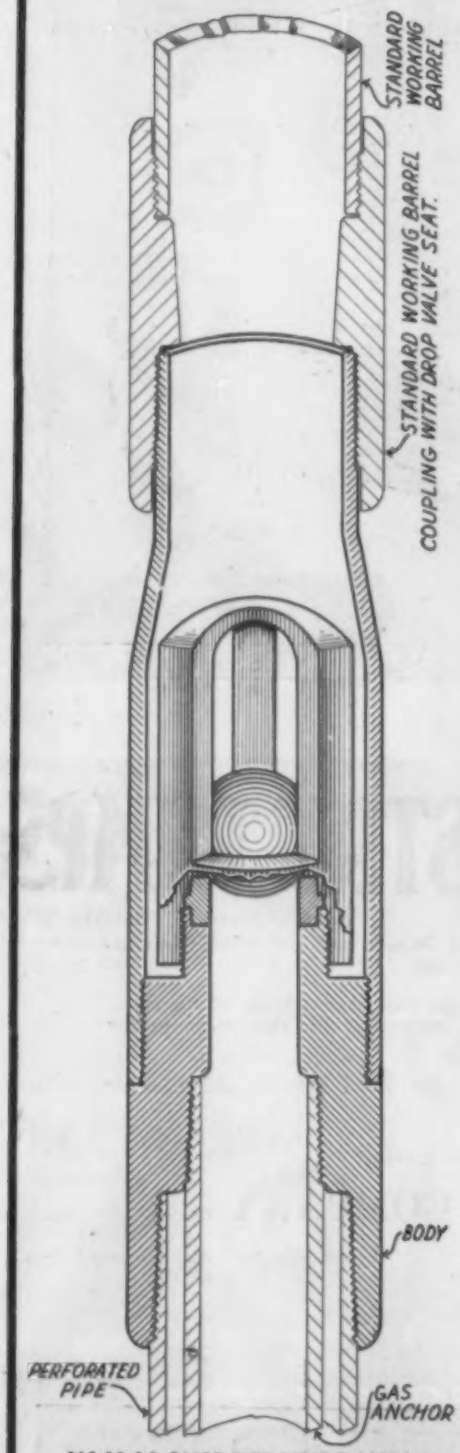

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1-12-24

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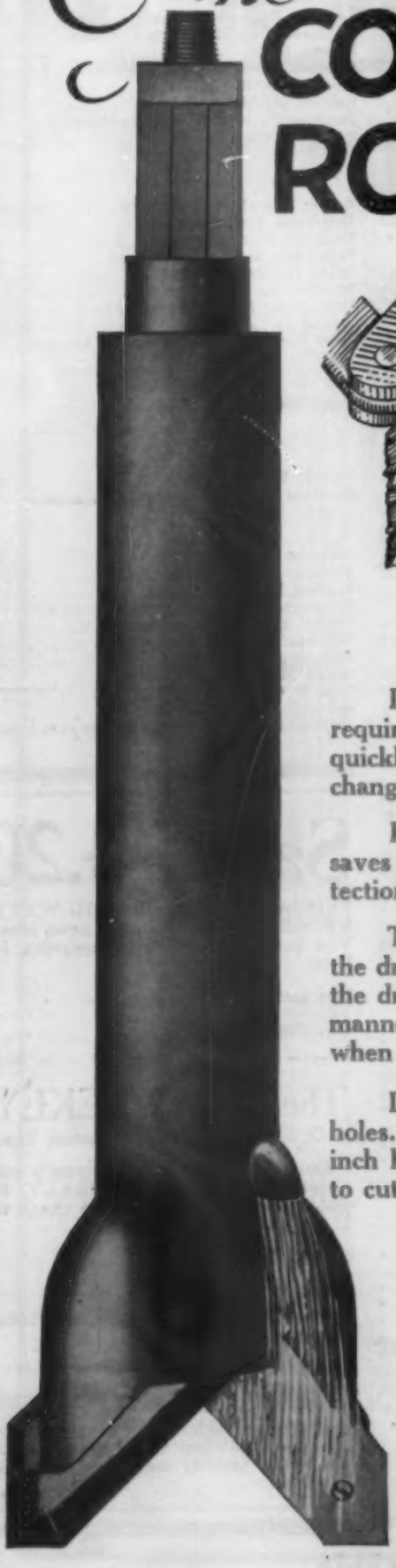
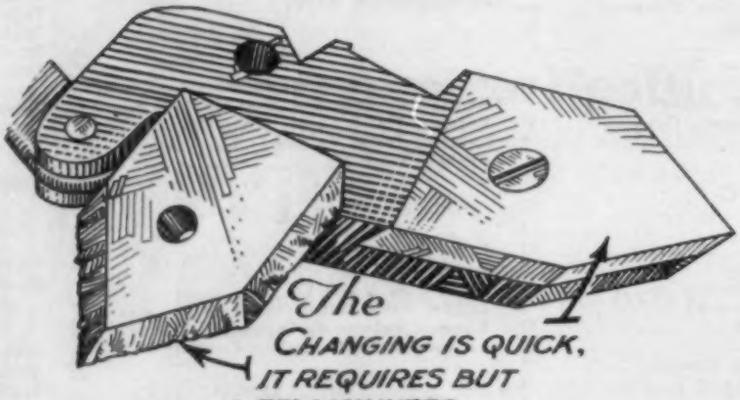
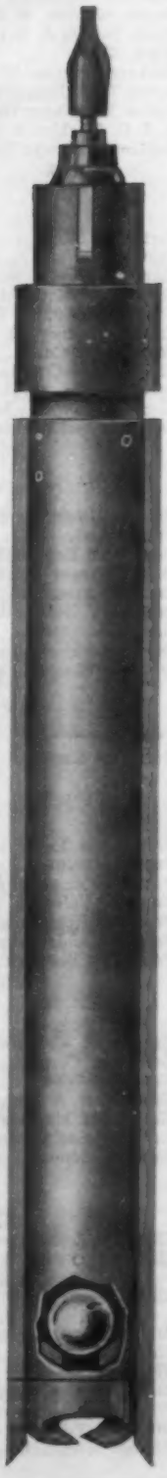
The STANDARD COLLAPSIBLE ROTARY DRILL





The CHANGING IS QUICK, IT REQUIRES BUT A FEW MINUTES



Descends inside the drill stem and expands to required diameter at bottom of the collar. It is quickly collapsed and withdrawn to surface for change of cutters, without removing drill stem.

It is the driller's and roughneck's friend, as it saves them much labor, and is the well owner's protection against rapid depletion of his bank account.

The Core Barrel descends like the drill inside the drill stem and is revolved by lugs in bottom of the drill stem collar. It is withdrawn in the same manner as the drill. The cutters are removable and when dull can be easily and quickly replaced.

Drills for 4 inch drill stem cut 8 and 10 inch holes. Drills for 6 inch drill stem cut 14 and 16 inch holes. However, each drill can be equipped to cut larger or smaller holes.

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THE OIL WEEKLY

An International Oil Publication for Oil and Gas Producers

MEMBER AUDIT BUREAU OF CIRCULATION

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HOME OFFICE—Houston, 1716 Dallas Ave.
FORT WORTH—212 W. T. Waggoner Bldg.
TULSA—225 Atco Bldg.

Published weekly by
Gulf Publishing Company
HOUSTON, TEXAS
R. L. DUDLEY, EDITOR AND MANAGER

PITTSBURGH—1507 First Nat'l Bank Bldg.
CHICAGO—453 First National Bank Bldg.
LOS ANGELES—1201 Haas Bldg.

Vol. 32 | SATURDAY, JANUARY 12, 1924 | No. 3

In this issue.

What They Found

After several years of drilling in various sections of England. A complete review of all operations carried on by the British government with geological maps illustrating what indications have been uncovered. Page 25.

Gas Water Helps

To locate deposits of oil. After an extensive investigation, the Bureau of Mines shows how showings of gas in underground waters may indicate oil possibilities. Page 13.

Up Another Dime

The Prairie was not satisfied with the advance in Mid-Continent crude made by The Texas Company several weeks ago, so another dime has been added to price of crude in Oklahoma, Kansas and North Texas. Market situation much better. Page 11.

Safety First

The fourth of a series of articles dealing with safety in the oil fields shows how improper methods of work may result in serious accidents. Page 17.

Drilling in Australia

Has resulted in the finding of very favorable indications for oil production. A correspondence received from one of The OIL WEEKLY subscribers in Australia tells what has been accomplished in the way of oil development. Page 12.

U. S. Production

The daily average output of United States fields is off again this week with a loss of approximately 28,000 barrels registered over the previous week. Production tables on page 32.

California Quiet

As a result of discontinued activities throughout the holiday season California continues to show a decline in her crude production. Attention shifts from Torrance to Compton, where a new sand has been discovered. Page 31.

What About Luling?

Luling is still growing. Another well has been brought in south of the San Marcos road, and the Lopez well over in Guadalupe County is still looking good. Page 38.

North Texas at Work

The total number of operations in Archer County, during the past week, increased to 118. Drilling activity in this county has registered a steady gain for several weeks. Page 37.

Regular Features

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KEY TO ABBREVIATIONS

Following is the explanation of abbreviations and signs used in drilling reports, completions, etc.: *—dry, abandoned well; ‡—salt water; †—junked and abandoned; ¶—million cubic feet of gas; abn—abandoned; bbls—barrels; b. s.—basic sediment; cas—casing; co—cleaning out; dk—derrick; dr—drilling; fsh—fishing; ft—feet; in—inches; loc—location; m—milling; N. S. E. W.—North, South, East, West; r—reaming; sd—shut down; sdtr—sidetracking; sp—spudded; sr—straight reaming; std—standardizing; sw—salt water; td—total depth; ur—under reaming; wo—workover; wosr—waiting on standard rig.

Look at Powell!

Since the discovery well was brought in in the Powell field, 32,000,000 barrels of oil have been taken from the sand. The Woodbine sand formation, furnishing production for the Corsicana-Powell, Mexia, Currie and Richland fields, is credited with having produced 105,000,000 barrels of oil. Page 36.

Oklahoma Awake

Operations in Oklahoma have not been materially handicapped by the cold weather and drilling is progressing in many parts of the state. Proration will probably be modified and that will mean more activity. Page 34.

Not So Good

Union Parish developments in Louisiana are not looking quite as good as was reported last week, but work is continuing. Webster Parish looks favorable. Page 39.

Eastern Fields Off

Statistics show operations in Eastern fields for the first week of the new year to be far below the average. However it is reported that plans are getting underway for a widespread campaign of activity in the early spring. Page 40.

Up in Canada

Drilling progress on deep tests in Southwestern Ontario have been held up on account of cold weather. As soon as a test has been made on one of the discovery wells, it is thought that work will be continued. Page 41.

Watch Reagan

A completion is expected within the next 10 days from one of the two tests drilling in the vicinity of the wildcat producer in Reagan County. The test is on the same section as the producing well and so far is looking good. See page 49.

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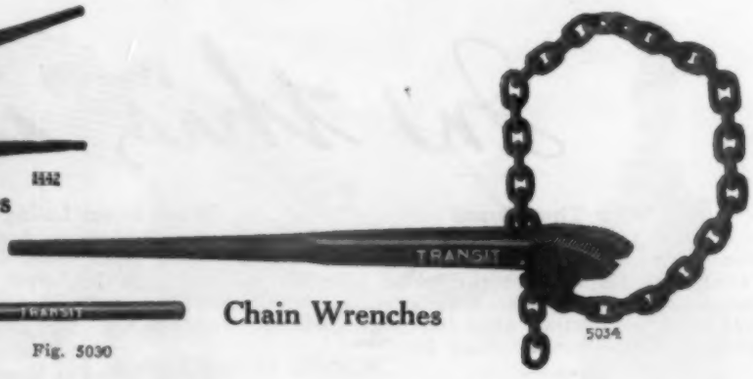
Red-Head Pipe Tongs



5034

Chain Wrenches

Fig. 5030

Carrying Tongs

Carrying Bars Fig. 5031

Spike Bars Fig. 5032

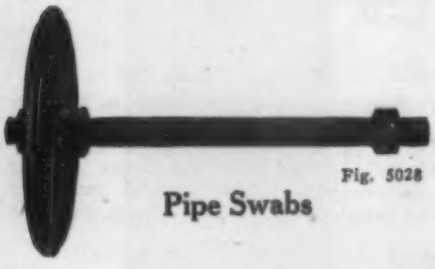


Fig. 5028

Pipe Swabs

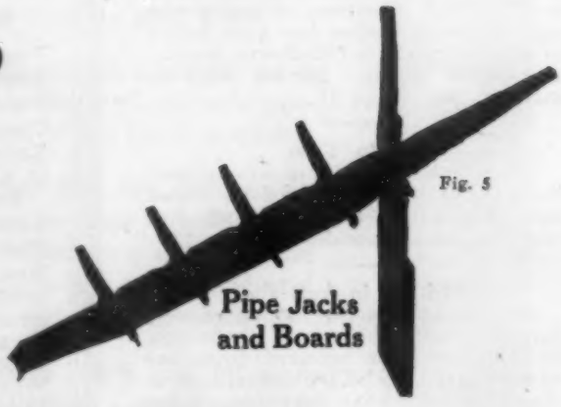


Fig. 5

Pipe Jacks and Boards

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JAN 14 1924

1924

THE OIL WEEKLY

An International Oil Publication for Oil Producers

ESTABLISHED 1916 — MEMBER AUDIT BUREAU OF CIRCULATION — VOL. XXXII-No. 3

"Liquid Gold"

"I see where a college professor in an oil State has proposed that the gross production tax on oil be increased to take care of the expense of a special chair of geology, and all through his statement as to why this should be done I noticed the words 'liquid gold' recurring frequently," said an executive of a large oil company to us this week.

"Liquid gold"—a power of magic in those words.

"Liquid gold"—they have filched the last silver from the thinly lined pockets of the poor. They have built imaginary fortunes that have gone down with a crash as the builders of the fortunes have stood in federal court, stripped of the glamor that a fantastic pen had thrown around them.

And now comes a college professor, using the magic term to coax more dollars from the industry that he fondly imagines subsists upon "liquid gold."

"We wonder if this college professor, who feels that the State in which he lives should keep part of the 'liquid gold treasure' at home, has ever given serious thought to the oil business as a real business," continued our oil company executive. "We wonder if he has ever taken stock of the fortunes that have been spent in the effort to bring crude petroleum to the surface in his State.

"That he should be anxious that his profession be advanced by the endowment of a chair of geology is not, in itself, to be discredited. It is perhaps the most natural thing in the world. But his use of the words 'liquid gold' brought the thought to my mind that maybe he, although a geologist himself, had never given serious thought to the 'other side' of the oil business.

"I wonder if he knew that in the Osage district in Oklahoma, the oil industry has spent a hundred and sixty million dollars more than it has taken out of the ground.

"If this man, who should have had a close association with the oil business, has this hazy idea of what the oil business is, if to him it is a magic business, an industry of molten gold flowing from the ground, how can we feel surprised if the public itself, with no acquaintance of the oil business, has gauged our industry wrong.

"To me Kettering's speech before the American Petroleum Institute at St. Louis was the most interesting of the entire meeting. He minced no words in telling the oil men that we should acquaint the public with our business.

"And when a college man, a geologist in one of the greatest oil producing States in the United States drips 'liquid gold' from his pen in an effort to sell the citizens of this state on the endowment of a chair in his college, it is a clinching argument in favor of our telling the public some of the facts without their being swathed in fancies."

The OIL WEEKLY wants only such subscribers as are engaged in the oil producing or pipe line business, or sub-branches of the producing and pipe line business. It has no desire for investor circulation, and it reserves the right and will exercise the right to reject subscriptions coming from persons whose only interest in the oil industry is through the purchase of oil stock.

R. L. DUDLEY, Publisher.

Facts About The Tret-O-Lite Process

The TRET-O-LITE process for reclaiming pipe line oil from crude oil emulsions, commonly called cut oil and tank bottoms, is the most thorough, convenient, and economical process in use. It is the most widely used process.

Fresh cut oil is being treated at a cost of ½ cent to 2½ cents per barrel of recovered oil. Tank bottoms average 6 cents per barrel of oil recovered.

This process may be adapted to any lease condition, and any **quantity** of oil can be treated with the **minimum of equipment** and labor.

The accumulation of Tank Bottoms can be **prevented** with TRET-O-LITE, by installing a Tret-O-Lizer on the flow line to the tanks.

The largest treating plant in the world is a TRET-O-LITE plant with a capacity of 25,000 barrels of pipe line oil per day.

No quantity of oil is too large and none too small to treat profitably.

There is no loss of gravity when the TRET-O-LITE process is used.

Regular oil field equipment only is used in TRET-O-LITE plants.

In most fields the oil is treated at the well temperature.

Some of the largest oil companies install TRET-O-LITE plants before the wells are drilled in, and carry a stock of TRET-O-LITE in their warehouses.

It is economy to keep a few drums of TRET-O-LITE on every lease. It does not spoil if kept for long periods.

Hundreds of millions of dollars worth of oil have been recovered by its use.

It has saved many valuable oil wells from total loss.

It has saved many small producers from financial ruin.

It has saved more oil for the large producers than any invention of recent years.

It has saved whole fields from loss.

We maintain experts in the principal fields who give the producer the benefit of their knowledge as TRET-O-LITE engineers.

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Mid-Continent Crude Gets Another Dime

Delayed Prairie's action adds impetus to growing improvement of situation

Tulsa, Oklahoma, Jan. 10.—Continued noticeable improvement in the crude oil situation in Oklahoma and Kansas was given further impetus this week, when the Prairie Oil and Gas Company, major Mid-Continent crude purchaser, met not only the recent advance posted by the Texas Company but advanced Mid-Continent oils another dime. The Texas Company followed the Prairie's lead.

This late addition to Oklahoma-Kansas and North Texas crude prices follows the re-appearance of independent refiners into the market as active purchasers of oil, with attractive offers of premiums.

Premiums

Until some ten days or two weeks ago premiums for crude oil were being paid in Tonkawa and the Osage and in some areas in Southern Oklahoma but was not widespread as to actual practice. Now, however, bounties are being paid for Hewitt and Graham crudes, or rather offered to producers there, as well as in the Bristow district and in the Cushing field in Oklahoma. The Rock Island Refining Company is reported to be offering a 25-cent premium for Hewitt and Graham oil while the Johnson Oil and Refining, Empire, Bolene, Champlin and others are giving inducements of a monetary consideration to producers with whom they are connected in the way of higher prices than the Prairie's scale. A premium as high as 50 cents a barrel for Cushing oil is reported while the average premium is ranging from 10 to 15 to 25 cents a barrel.

In Kansas the larger independent purchasers, such as Derby, White Eagle, Skelly and others, are not paying a bounty for the oil they are buying, so far as can be learned here, but in a few instances some smaller refining interests in the Sunflower state are having to top the Prairie's price with a slight inducement in order to insure their crude supply. Some of these independent purchasers in Kansas have already met the Magnolia and The Texas Company's scale which means that producers with whom they are connected are in reality getting more for their oil than are those who sell to Sinclair and the Prairie. The starting up of the Roxana Petroleum Corporation's refinery at Arkansas City already has had a wholesome effect in that section and the fact that the refinery is in close proximity to the new Cowley-Sumner county development may augur well for both refiner and producers in that area.

Prairie's Deliveries

Indicative of the improvement in the northern and eastern crude oil demand is the report of deliveries of the Prairie Pipe Line Company for the month of December which has been announced. Total deliveries for the last month of 1923 were 4,162,759.60 barrels, or an increase over the previous thirty day period of 1,512,193.54 barrels. Deliveries of the Prairie in January are not only holding up well but likely will top the December total. The Prairie now is handling in the Mid-Continent approximately 150,000 barrels a day, some of which is going to storage. Within the last month and a half, however, less and less oil the Prairie has been buying has been run to storage, outside deliveries having shown renewed impetus. Sinclair is handling today in the neighborhood of from 75,000 to 80,000 barrels and little if any of this oil is being run to storage, so far as can be learned. The Magnolia is running around 60,000 barrels daily in the Mid-Continent, the Gulf and Gypsy in the neighborhood of 40,000 barrels and the Texas Company approximately 22,500 barrels daily. The Empire is averaging from 18,000 to 20,000 barrels a day. These figures are the result of a check of the field just completed by one of the larger buyers of crude.

Two factors, either one of which is of considerable import, have been injected into the crude oil situation within recent weeks in Oklahoma. The one is the probability of another Osage sale in February or March and the other is the attitude that operators in the Burbank pool will take as regards the continuance of their shut-down agreement entered into last summer and which has been prolonged from month to month until now. The decision is to come January 10 at a meeting here in Tulsa. It appears likely that the agreement at least in part will be modified if not entirely abrogated and strength to this opinion is given in the fact that some of the larger companies have about completed preparations to start operations again in the Burbank on an extended scale and have so notified drilling contractors who are coming out of their lethargy of the past several months and are once more bestirring themselves and are showing haste about it, too.

There is little doubt but that the Osage Indians want another sale. They need the additional cash such an auction would bring in and if they have their way about it the secretary of the interior department at Washington will order a sale held. However, there are some who believe that Superintendent J. George Wright of the Osage Agency is not so enthusiastic about a sale right at this time and if this be true, as many think, the February auction of the Indian lands may not come off after all. A sale at this time would not improve the crude market but on the other hand might exert a detrimental effect on the trend of prices during the spring as well as agitating the Oklahoma crude oil production curve which has steadily been going downward for some time

As to the abrogation of the Burbank shut-down agreement, here's the bit of advice one large operator gives: "What we ought to do is to sit steady and not make a move for more drilling until

Stocks of Crude Petroleum

PIPE-LINE AND TANK FARM STOCKS OF CRUDE PETROLEUM ON LAST DAY OF MONTH (Barrels)

Stocks are reported by fields of origin of oil, not by location of storage.

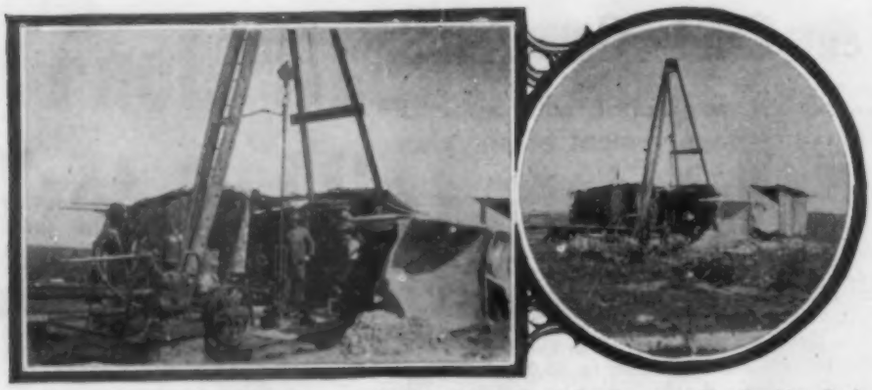
		Oct. 31, 1923	Nov. 30, 1923	Nov. 30, 1923
Domestic petroleum: East of California: Gross and net pipe line and tank farm stocks:				
Appalachian—New York, Pennsylvania, West Virginia, Eastern and Central Ohio	Gross	6,611,000	6,578,000	6,201,000
	Net	6,333,000	6,302,000	5,940,000
Kentucky	Gross	3,144,000	3,075,000	3,058,000
	Net	3,011,000	2,946,000	2,943,000
Lima-Indiana	Gross	1,137,000	1,166,000	915,000
	Net	901,000	930,000	661,000
Illinois—S. W. Inidiana	Gross	11,942,000	11,953,000	10,532,000
	Net	11,494,000	11,507,000	10,031,000
Mid-Continent—				
Oklahoma, Kansas, Central and North Texas	Gross	175,355,000	180,644,000	147,612,000
	Net	164,070,000	169,572,000	137,240,000
Northern Louisiana and Arkansas	Gross	30,483,000	31,752,000	16,001,000
	Net	164,070,000	169,570,000	137,240,000
	Net	28,913,000	29,091,000	15,370,000
Gulf Coast	Gross	24,946,000	25,075,000	27,027,000
	Net	24,598,000	24,730,000	25,431,000
Rock Mountain	Gross	14,828,000	16,815,000	1,488,000
	Net	14,819,000	16,805,000	1,475,000
Total pipe line and tank farm stocks east of California	Gross	268,446,000	277,058,000	212,834,000
	Net	254,139,000	261,883,000	199,091,000
California (as stated above)		60,127,000	60,346,000	48,851,000
Imported crude petroleum held in the United States by importers elsewhere than at refineries:				
At Atlantic Coast stations		260,000	348,000	*
At Gulf Coast stations		830,000	789,000	*
		1,090,000	1,137,000	
Total domestic net pipe line and tank farm stocks east of California; producers', pipe line and tank farm stocks in California, plus stocks of imported crude petroleum held in the United States by importers elsewhere than at refineries		315,356,000	323,366,000	*

*Not available.

DAYS' SUPPLY OF PIPE LINE AND TANK FARM STOCKS
(Based on monthly rate of deliveries of crude petroleum to consumers)

September, 1923	October, 1923	November, 1923
152	154	159

(Crude Prices, Page 18)



Drilling work going on in Australia. To the right is test No. 1 Caroline, near Mt. Gambier, S. A. At the left No. 2 Caroline, in the Parish of Grey, S. A.

Prospecting Work Develops Favorable Indications for Production in Australia

Mt. Bambier, South Australia, Jan. 1.—Australia may soon be a factor in the oil world if developments continue as they are being planned at the present time. The South Australian Oil Wells Company has one well drilling at approximately 700 feet, and another is to be spudded shortly.

Carolina No. 1 is located near Mt. Gambier, and is drilling in gray marl. This well had a slight show of oil in gypsum rock. Formations have been lime, dolomite, gypsum rock, marl and flint.

The South Australian Oil Wells Company owns leases on more than 15,000 acres in South Australia, adjoining the border at the mouth of the Glenelg river. Two seepages have been discovered on holdings of the company and analysis has shown the oil from these seepages to be of fairly high gravity with paraffin and asphaltic base.

According to recent surveys, the geological structure of the country is favorable for oil production. It is known from bores that the succession of porous and impervious strata is correct. Cap rocks overlie sandy lenses, and the whole has been folded into anticlines and other structures favorable for the accumulation of oil. It is also known now that petroleum occurs in the strata in question.

An investigation of the seepages was made by H. S. Lyne, geologist, who stated that crude petroleum was found to be seeping up through mud on the right bank of the Glenelg river, about 15 miles upstream from Nelson. He is of the opinion that the seepage indicates the presence of petroleum in the district, and that there is a probability of finding oil in the area. He based his belief that petroleum has been formed and still exists on the presence of a suitable anticlinal structure for the accumulation and retention of petroleum, and on the existence of suitable cap rocks, bores which have been sunk, having passed through alternating beds of clay, sand and shale.

AUSTRALIAN BONUS

New York, N. Y., Jan. 7.—Cable advices from Australia are that the Australian government has offered $50,000 in cash to anyone who can discover oil on the island in paying quantities.

the Prairie hikes the price. We've got it coming to us and there's no use starting a lot of flush production at a time when oil is too cheap—much too cheap. I'm for sitting tight." Undoubtedly, this is mighty good advice if you want to follow it.

The optimistic utterances of Walter C. Teagle of New York, president of the Standard Oil Company (New Jersey) and E. W. Sinclair, president of Sinclair Consolidated, as regards the 1924 crude and refined oil outlook is well received here. It would be a difficult task, indeed, to find one who might be prone to disagree with Messrs. Teagle and Sinclair. And almost in the same breath comes this: "But why don't we get that crude increase?" You answer it!

Geological Society Hears Talk on Louisiana Fossils

Shreveport, La., Jan. 6.—Dr. H. V. Howe, professor of geology at Louisiana State University, talked to the Shreveport section of the Southwestern Geological Society at its regular meeting last week, taking for his subject the oligocene formations in Louisiana.

He stated that he is at present engaged in a study of the fossil content of the entire tertiary in Louisiana, with the hope of developing type species of fossils for the purpose of assisting geologists of this region in differentiating these formations. It previously has been very difficult to correlate formations encountered in drilling in Louisiana, because of the lack of sufficient detailed work on their fossil content, and the belief has been expressed by many that the fossils contained extend with such range through the formations that they offer but little clue to specific horizons. Dr. Howe, however, stated to members of the Shreveport section that his work, so far, leads him to be optimistic in regard to the value of fossils in distinguishing the respective formations, in as much as his experience seems to indicate that the fossil content of the different formations are distinguishable when a direct comparison of one with the other can be made. If viewed separately, however, fossils from different formations are found to be confusingly similar.

The Shreveport section of the society is in a way responsible for the establishment of the Chair of Geology at Louisiana State University, and Dr. Howe was chosen for the professorship because of his excellent training and work in the tertiary formations.

Believe Commercial Shale Process Found in Sweden

Washington, D. C., Jan. 8.—Considerable interest has been aroused in Sweden by work carried on by scientists and engineers among Swedish shale deposits, particularly those in the western part of the country, which appear of a most promising nature, it is declared in a report just received by the Petroleum Division of the Department of Commerce. During the war, when Sweden experienced great difficulties in obtaining necessary supplies of oil, a shale oil industry was developed, but in normal times this industry was not able to gain oil at competitive prices, and in 1921, according to official figures, the production for the whole of Sweden only amounted to 325,840 kilos, with a value of $8732.

Sweden is a heavy importer of oils, using more than $10,000,000 worth a year, and experiments have been made continually in order to reduce these imports by obtaining oil from shale. It is now reported that the problem has been solved by a method invented by two Swedish engineers, whose furnace has been working continually for two months with results that are claimed to be very gratifying from a technical as well as an economical point of view.

State experts have examined the tests and have expressed their opinion that there is no doubt but that the mechanical problems have been solved. However, they are still reserved regarding the economical results, which will be proved as soon as the quality of the oil has been carefully examined. It is estimated that there are 74,800,000,000 tons of shale in the country containing one and one-half per cent of oil or better.

Mines Bureau to Be Under Department of Commerce

Washington, D. C., Jan. 8.—Transfer of the Bureau of Mines from the Interior Department to the Department of Commerce, which is contemplated under the plan for the reorganization of the government services, may be expedited by the issuance of an executive order, according to plans which are now under consideration by the president and his cabinet. It is declared no obstacle interferes with this plan, since the removal of the bureau has the approval of both secretaries concerned.

There is also a number of plans proposed to make various bureaus into independent departments, one of which contemplates this treatment for the Bureau of Mines. There are, all told, 12 such movements on foot which, if successful, would result in adding 12 members to the cabinet.

The reorganization plan contemplates taking the production figures now compiled by the Geological Survey and placing that work with other statistical operations in the Department of Commerce.

Gas Content of Water Aids in Finding Oil

Tests show that underground water will absorb a definite quantity of hydrocarbon vapors

*By G. W. Jones, W. P. Yant and E. P. Buxton**

ANY liquid, with the exception of mercury, if permitted to come in contact with gases or vapors, will absorb a definite amount thereof. This action depends on the following factors: (1) the kind of gas; (2) the percentage composition of the gases in contact with the liquid; (3) the pressure of the gas; and (4) the composition and temperature of the liquid. For our present purpose it is only necessary to consider two of these factors—namely, the gas or vapor (natural gas and light petroleum vapor,) and the liquid (water).

If water of underground origin traverses a gas or oil sand it will absorb a definite quantity of hydrocarbon vapors, and will carry these vapors to the surface when tapped by a well. When the water is exposed to the air at the surface, the gases and vapors will be given off and their place taken by oxygen and nitrogen from the air. Therefore, an analysis of the gases in waters reaching the surface from an underground source should be of value in determining whether these waters have traversed or came in contact with hydrocarbon-bearing strata. With the apparatus herein described it is possible to determine whether the vapors are mainly of natural gas composition (methane CH_4) and ethane (C_2H_6) or are composed mostly of heavier petroleum vapors (ethane, propane (C_3H_8), and butane (C_4H_{10}).

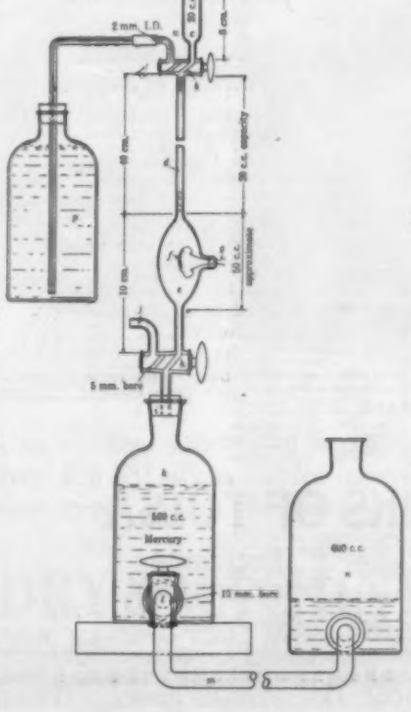
The writers realize from the tests which have been made that the application of water analysis will be of little value for certain regions—for example, in the Pennsylvania fields where there are many producing sands. Samples of water of deep origin from this region nearly always show on analysis high percentages of hydrocarbon vapors due to the many gas and oil sands present. For newly prospected regions, analyses of the gases in the underground waters should be decidedly helpful provided that the source of the water is known, and means are available for obtaining waters of deep origin. This suggests the value of testing the water in a well as drilling progresses, and as an aid in determining whether it is advisable to drill deeper in quest of oil or gas sands. The geologist should thus be aided in his predictions as to what newly prospected regions are most likely to be productive of petroleum or natural gas.

Decomposing carbonaceous material protected from the air (oxygen) produces marsh gas or methane. This is a common occurrence around swampy marshes and lakes. In some places the gases rise to the surface in fairly large quantities. Gases of this character usually carry large percentages of carbon dioxide, so that in case an underground water shows quantities of hydrocarbons, also considerable carbon dioxide, the conclusion may be drawn that the gases are of recent origin and not present in sufficient quantities to warrant drilling. Also, waters that have come in contact with coal or oil-shale will absorb hydrocarbon gases from them, and may lead to erroneous conclusions. These suggestions are offered merely to show how the analysis of gases in underground waters may be applied to prospecting. The analyses that have been made show that the apparatus can be used in the field for such work. However, the interpretation of the results will require much practical field work coupled with actual results before its utility can be proved.

Apparatus

The apparatus[1] for determining dissolved gases in waters was developed in connection with a problem of ascertaining the dissolved gases in boiler feed waters. In general, most gas apparatus especially those types for accurate results, are rather complicated, delicately constructed, and only applicable for laboratory use in the hands of a skilled manipulator. In this work the writers have adhered to the view that any field apparatus must be as simple as possible, with few parts, portable, and not easily broken. The apparatus shown in Figue 1 was developed with this idea in view; and although it requires a considerable amount of mercury for its operation, which is heavy to transport and fairly expensive, the initial outlay is the only expense, since the mercury can be used repeatedly.

Referring to the figure, k is an ordinary 500 c.c. aspirator bottle having openings in the top and bottom. The bottom opening is closed with one-hole rubber stopper and connects with another aspirator bottle (**n**) of about 750 c. c. capacity by means of cock **l** and heavy pressure tubing m. These parts are all standard equipment usually found around a laboratory. The analyzing and measuring burette **d** connected to the top opening of aspirator bottle **k**, is of special construction. The upper part of this burette is a three-way, parallel bore cock **b** from the top of which a capillary tube **a** for introducting water into the apparatus, and a cup **c** for introducing chemicals into the burette to remove the different gases. The stem of the burette is a small bore graduated stem of 20-c. c. capacity and has an enlarged portion or bulb **e** of 50 c. c. near the bottom. This bulb has a side outlet **g** through which are introduced two platinum leads sealed in a short length of glass tubing. These in turn connect to a 2-inch spiral **f** of No. 30 B. & S. gauge platinum wire. The glass tubing containing the platinum leads is held in place by a rubber stopper which closes the opening. Several methods were tried for introducing the platinum spiral into the burette and different positions of the spiral, but that shown proved the most satisfactory for removal and repairing. The spiral is heated by four dry cells connected in series. The bottom part of the burette has a large 3-way parallel bore cock **h**. The lower projection passes through a rubber stopper **i** in the neck of the aspirator bottle **k**. The end should come just flush with the lower edge of the rubber stopper. The other branch **j** from cock **h** is bent at right angles to the left.



Procedure of Analysis

To prepare the apparatus for analysis, the aspirator bottles, rubber tubing, and burette are connected as shown. Cocks **b** and **h** are removed and lubricated with a good grade of stop-cock grease, prepared by melting together 50 parts pure para rubber, 25 parts of vaseline, and 20 parts of beeswax. Rubber stopper **i** is also coated with a thin film of the grease, and then pressed firmly into the neck of the bottle. During the first evacuation, the reduced pressure inside the bottle draws the stopper firmly into place and makes a secure gas-tight connection. Sufficient mercury is poured into aspirator bottles **k** and **n**, so that when **n** is raised, mercury completely fills **k** and burette **e**. The apparatus is placed on a suitable bench at least 3 feet high.

Testing for Leaks

Before making an analysis with the apparatus it should be thoroughly tested for leaks. This is easily done by raising **n**, causing the mercury to rise in **k** and completely fill the burette to and including cock **b**. Permit the mercury to continue to rise until there is about 1 c. c. of mercury in cup **c**. Close cock **b**, and lower **n** to the floor. The mercury will fall in **e** and **k**, producing a vacuum in the apparatus. When the level of the mercury reaches cock **l**, close **l**, and let the apparatus stand 2

*With the Bureau of Mines.

[1]This apparatus was devised by G. W. Jones and W. P. Yant, and made and tested at the Pittsburgh Experiment Station.

minutes or longer. If no leaks are present, on raising **n** again and opening **l** the mercury should rise and completely fill the burette to the very top. An accumulation of gas in the top of the burette below **b** indicates a leak, so cocks **b, h,** and **l** and rubber stopper **i** should be inspected for leaks.

Charging the Apparatus

When the apparatus is found to be gas-tight, **n** is raised and **b** is turned to connect with capillary tube **a**. The mercury is permitted to rise until it completely fills the burette, and capillary **a** to the very end, when **b** is closed; **a** is then placed in the sample water in bottle **p** to be analyzed, **n** is lowered to the floor, **b** is opened to **a**, and 350 to 400 c. c. of water is drawn in through the burette, into bottle **k**. The exact volume is not recorded at this point, as any measurements made would lose some of the dissolved gases and introduce air into the sample. (Magnesium citrate bottles holding abou 375 c. c. of water are handy receptacles for collecting waters for analysis by this method.) In drawing water into the burette from the bottles, care should be taken not to let water level in the bottle fall below the bottom of capillary **a**, otherwise some air will get into thhe burette and spoil the analysis. When the desired amount of water has been introduced, **b** is closed. As the water comes into the burette through **b** it bubbles and froths due to the high vacuum, passes down through burette through bulb **e** and cock **h** into aspirator bottle **k**. During the process a large part of the dissolved gases are evolved; **l** is opened and all of the mercury flows through it, when it is closed. Since all of the mercury is out of **k** and only water remains, the apparatus is not heavy; and it is taken in the hands and shaken for one minute to aid in removing the dissolved gases; **n** is then raised, **l** is opened, and when water reaches the bottom edge of cock **h**, this is turned 180 degrees and the water is forced out through the left-hand branch **j** into a graduate and measured. When mercury rises in **j**, cock **h** is turned 180 degrees connecting **k** with the burette, and the mercury level in **n** and stem **d** is brought to the same height, and the volume of evolved gases is measured.

Analysis of the Evolved Gases

Two cubic centimeters of caustic soda (10 parts NaOH to 90 parts of water) is put into cup **c**; **n** is lowered a few inches, then cock **b** is slowly opened to **c**, thus drawing the solution into the burette. Just before all the solution in cup **c** is drawn into the burette, **b** is closed, and **n** is raised and lowered a foot or so several times in order to give better contact between gas and caustic and thus hasten the removal of the carbon dioxide; **n** is then raised until the mercury level in **n** and **d** are at the proper height, making due allowance for the column of caustic solution in stem **d**—that is, since mercury is about 12 times heavier than caustic solution, should there be 1 inch of solution over the mercury in stem **d**, the mercury level in **n** should be one-twelfth this distance above the mercury level in **d**. The volume of gas is then read by taking the reading from the top of the caustic solution. When this reading is subtracted from the initial volume of gas, and the difference divided by the initial volume of gas multiplied by 100, the result is the percentage of carbon dioxide present.

Determination of Oxygen

Without removing the caustic solution from the burette, 0.5 c. c. of pyrogallic solution (one part pyrogallic acid to 3 parts water) is put into cup **c** and introduced into the burette, and the oxygen is determined and calculated in the same manner as given under directions for carbon dioxide.

Determination of Hydrocarbons

After the oxygen determination has been made, lower **n** until the liquid in the burette falls to the lower edge of cock **h**, and while in this position turn **h** 180 degrees connecting with **j**; raise **n** again, thus forcing out all of the absorbing liquid. Turn **h** 180 degrees, connecting with burette again, and pour 15 c. c. of water into cup **c**. Introduce into burette as previously described, and discard through **j**. Repeat this process twice more with 15 c. c. portions of water, and then with 15 c. c. of very dilute (0.5 per cent) sulphuric acid and discard. The acid neutralizes the caustic remaining in the burette from the carbon dioxide and oxygen determinations.

Connect **a** to an oxygen supply (an "Ozone" generator is recommended for field use,) lower **n** slightly to put the gas in the burette under reduced pressure, and slowly open cock **b** to **a** and draw into the burette sufficient oxygen to make a total volume of approximately 20 c. c. Close **b**, and read the total volume after bringing the mercury levels to their proper positions. Lower **n** until the mercury flows out of **k** after

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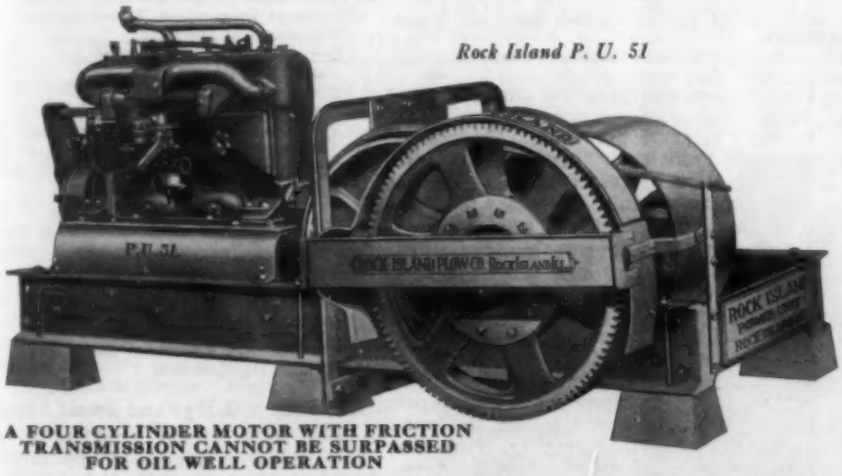

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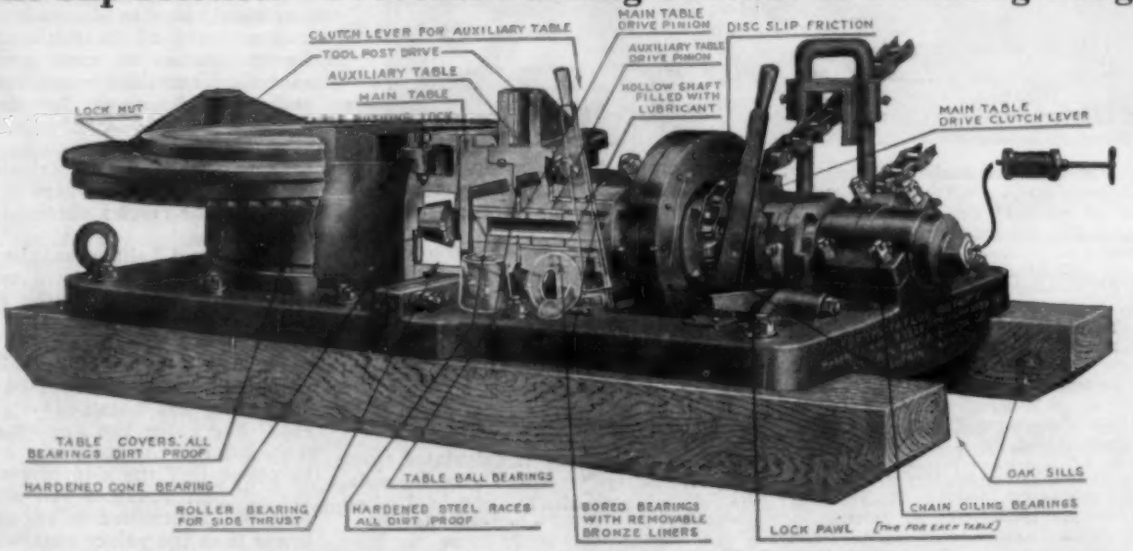

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TABLE I

Results of tests made with large and small apparatus to show variations obtained with apparatus of different size and when different volumes of water are taken for analysis. Same water used for all the tests given)

Test No.	Volume of apparatus (B) c. c.	Volume of water analyzed (C) c. c.	Volume of gas evacuated 1st evacuation c. c.	Volume of gas evacuated 2nd evacuation c. c.	Volume of gas evacuated Total c. c.	Volume of gas evacuated c. c. per liter	Vol. of gas calculated by equation from 1st evacuation In samples taken c.c.	Vol. of gas calculated by equation from 1st evacuation Per liter	Average variation determined from calculations per liter c. c.	Variation
1	1115	400	7.90	0.35	8.25	20.62	8.26	20.65	—0.03	0.1
2	1115	800	15.20	0.90	16.10	20.13	16.46	20.56	—0.43	2.1
3	585	400	7.45	0.65	8.10	20.25	0.801	20.02	+0.23	1.1
4	585	400	7.35	0.58	7.93	19.82	0.790	19.75	+0.07	0.4
5	585	400	7.47	0.72	8.19	20.50	0.803	20.08	+0.42	2.6
	Average					20.26		20.21	+0.05	0.2

In substitution values in the formula, those in the second column represent the factor B and those in the third column, C, respectively, in the formula.

which close cock 1, and turn on the current through the spiral f. By drawing the mercury from k, the gas is under considerably reduced pressure, thus preventing an explosion. However, after closing cock 1, raise n above the level of cock 1 so that tube m will not be under unnecessary conditions of vacuum which might cause leaks. Allow to burn intermittently—approximately 30 seconds on and 30 seconds off—in this position for three minutes, and then shut off current through f and allow to cool. Open cock 1 in the regular manner, and read the contraction produced. Introduce caustic into the burette and determine the carbon dioxide produced as previously given, and read the volume as before. From the contraction and carbon dioxide produced the cubic centimeters of hydrocarbons present in the sample can be determined by the following formula;

$$\text{Ethane (c.c.)} = \frac{2CO_2\text{—contraction}}{1.5}$$

$$\text{Methane (c.c)} = CO_2\text{—2 ethane}$$

These values, when divided by the initial volume of sample taken and multiplied by 100, gives the percentage of methane and ethane present. A typical example follows:

Statement of Analysis

Water taken for analysis, c.c.	400
Volume of gas extracted, c.c.	9.20
Volume after CO_2 absorption, c.c.	5.70
Difference	3.50
Per cent CO_2 = 3.50 / 9.20 x 100 =	38.
Volume after oxygen absorption, c.c.	5.70
Difference	0.00
Per cent oxygen = 00 / 9.20 x 100 =	0.
Total Volume plus oxygen, c.c.	17.70
Volume after burning, c.c.	9.20
Contraction, c.c.	8.50
Volume after CO_2 absorption, c.c.	3.08
Contraction due to CO_2, c.c.	6.12
Ethane c.c. = (2x6.12—8.50) / 1.5 =	2.50
Per cent ethane = 2.50x100 / 9.20 =	27.
Per cent methane = (6.12—(2.50x2))x100 / 9.20 =	12.
Per cent nitrogen (by difference) =	23.

In the method employed it is impossible to read the volumes closer than 0.02 c. c., also only a small sample of gas is used for analysis and change of temperature and pressure affect the results. The analyses are reported only to the nearest 1 per cent. This, however, is sufficiently accurate for the interpretation of results with reference to the composition of the gases present.

It should be mentioned that the procedure described does not remove all of the dissolved gases present. From 4 to 9 per cent is left in the water, depending upon the volume of water taken, the size of apparatus, temperature, and pressure in which the analysis is made, and cubic centimeters of gas liberated. For the purpose of this paper the user mainly interested in the percentage composition rather than the actual volume of dissolved gases present. However, the actual total volume of dissolved gases can be easily calculated by the following formula:

Calculation of Dissolved Gasses

$$T\,G = V + V\left(\frac{V}{B-C} + 0.035\right)$$

where T G=total gas in water,
V=volume of gas removed by apparatus by one evacuation,
B=volume of apparatus,
C=volume of water used for analysis, and
0.035=vapor pressure of water in atmosphere at 26°C.

As an example of the application of this formula the following analysis is given, in which all of the gas was removed by three successive evacuations:

	c.c.
Volume of water used for analysis	495
Total volume of apparatus	1115
Volume of gas removed by fist evacuation.	9.88
Volume of gas removed by second evacuation	0.40
Volume of gas removed by third evacuation	0.15
Total volume of gas by analysis	10.43

If the total volume is calculated from one evacuation by the above formula, the following results are obtained when B=1115 c. c., C=495 c. c., and V=9.88.

$$\text{Then } T\,G = 9.88 + 9.88\left(\frac{9.88}{1115-495} + 0.035\right)$$

$$= 9.88 + 9.88\ (0.050)$$

$$= 9.88 + 0.49 = 10.37 \text{ c.c.},$$

or difference of 0.06 c. c. from the determined result. In fact, the calculated result is probably more accurate than the determined value, due to possibility of small leaks when the apparatus is evacuated so many times as is shown by the rather large amount of gas removed by the third evacuation, which, according to equation 1, should be less than 0.05 c. c.

The above formula gives the total volume of gas at the temperature and pressure of analysis (26° C. and 745 mm. Hg., an average figure at which most analyses are carried out.) If the results are to be interpreted at other temperatures and pressures, or if the analysis is made at a widely varying temperature and pressure the above formula becomes:

$$T\,G = V_1 + V_1\left(\frac{V}{B-C} + \frac{W}{P}\right)$$

where T G=total gas removed at temperature T, and pressure P, the temperature and pressure at which the analysis is made,
V_1=volume of gas liberated by one evacuation at temperature T_1 and pressure P_1,
B=volume of apparatus,
C= volume of water used for analysis in mm. Hg.,
W=vapor pressure of water at temperature T_1,
P_1=barometric pressure in mm. Hg. at time of analysis, and
F_1=temperature of water C. at time of analysis.

If the volume of total gas is reduced to normal temperature and pressure, then:

$$V = \frac{273 \times T\,G \times P}{(273+T_1)\ 760}$$

where V=the volume of gas at 0° C. and 760 mm. Hg. pressure.

Accuracy of Large and Small Apparatus

For some of the analyses given in this report a large size apparatus was used (1115-c. c. capacity,) but tests were made later which showed that a much smaller apparatus could be used, it being more convenient to handle, and the volume of residual gas in the water can be computed if desired.

In order to determine the variations that result when a smaller apparatus is employed, also to determine the general accuracy of the method when different volumes of water are used for analysis, a standard water was prepared and analyzed with the two different apparatus. The total volume of dissolved gases was determined by two evacuations, and was also calculated from the volume of gas liberated by one evacuation. The results obtained are given in Table 1.

Tests 1 and 2 show that the volume of water used can be varied within wide limits without affecting the general accuracy of the results. The calculated value of 400 c. c. of water was taken gave 20.65 c. c. per liter, and when the volume of water was doubled (800 c. c.) 20.56 c. c. was obtained—a remarkably close check for the apparatus. When the volume of the apparatus was reduced to about half the size of test 1 and 2, the calculated values ran slightly less than the determined values and slightly lower than the values obtained with the larger apparatus, although some of the gases may have escaped from the water due to standing, since the tests made with the smaller apparatus were made on the following day. At any rate the results obtained with the smaller apparatus are sufficiently accurate for the purpose for which it is intended. The table also shows that the calculated values on an average agree within 0.2 per cent with the determined value, and in actual use only one evacuation of

(Continued on page 21)

Promote Safety and Reduce Time Losses

Improper methods result in many field accidents sometimes listed unavoidable

LACK of instruction with its disastrous consequences is the fourth cause in the series of articles dealing with the fundamental causes of accidents in field work. This article is to deal with methods not suitable for the work to be done, which is cause number four.

Many accidents occur under this classification that are spoken of as being unavoidable. For instance, blow outs happen frequently, but in a majority of cases these could be avoided if the proper methods and the right kind of equipment were used. There are a good many blow-out preventers on the market, and while all may not be satisfactory, it is certain that some of them do reduce blow-out hazards.

Fires have their origin in improper methods of working around wells in many instances. It is reported that the terrible fire in the Powell field last spring, when fourteen men lost their lives, is thought to have been started form a spark caused by hammering. Another report has it that the gas was ignited by a cigarette. Neither of these causes could be justified. Many burns received in the field are results of improper methods of fighting fires.

The most progressive companies have issued instructions to be followed when a fire breaks out and it is becoming the rule that every employee must familiarize himself wit . these instructions.

Innumerable accidents are known to result from haphazard mehods—or rather a lack of method, not only in the producing field but in refineries and along pipe-lines as well. One writer has classified unsafe methods of doing work around pipe-lines, somewhat in the following manner:

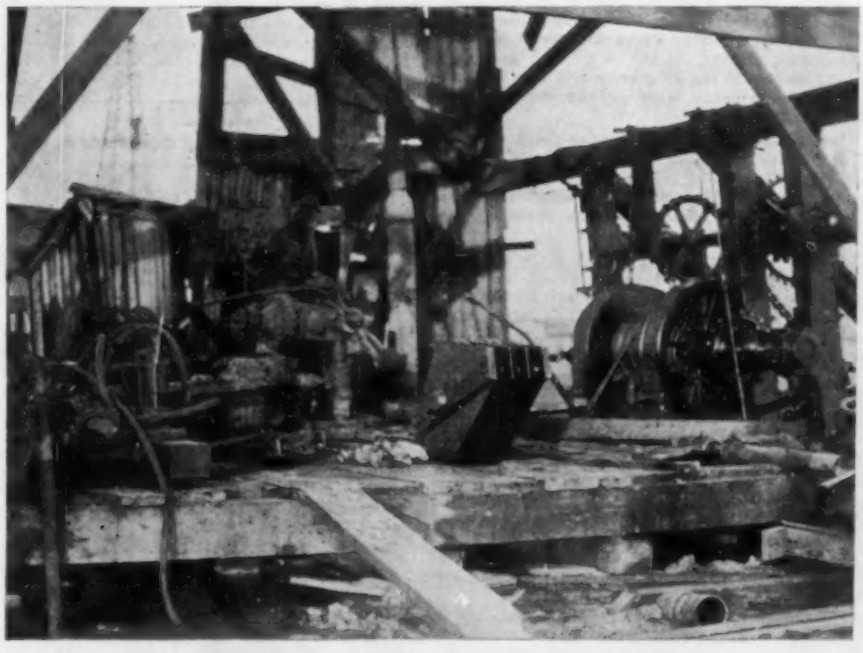
a. Overloading Equipment: Before ropes, chains, cables, jacks or blocks are used, they should be inspected for defects and weaknesses. Worn material can cause many accidents. All such material should be tested.

b. Ditching: Sometimes in going down into a ravine or under a stream, it becomes necessary to dig deep ditches in pipe-line work. Experience has shown that when over five feet deep, unless the soil is very firm, the sides of the ditch should be sloped to the bottom. This eliminates much of the danger from caving walls. It is also very important for workers in a ditch to keep at considerable distance from each other.

c. Bending Pipe Cold: There is a good deal of hazard when pipe must be bent and the line is placed upon jacks if the jack and "growler"-boards are not properly braced, especially when men are put on from 2 to 4 pipe tongs to bend the pipe. Broken bones can often be prevented by a proper bracing of the jack and growler-board.

d. Goggles not Provided Where Necessary: Where there is the least bit of danger from metal chips, goggles should be worn. They cost little, and are great protective measures. One instance is reported where a safety inspector went through a construction gang about two o'clock one afternoon. He reminded one worker that his work was of such nature that goggles would be of great value. That workman took the inspector's advice and the same afternoon about five o'clock one of the glasses in these goggles was shattered by a flying piece of metal, but the man's eye was not injured.

e. "Poor Housekeeping": This is a term which includes much. Perhaps the most general application can be made by referring to the illustration on this page. Material has been strewn about the derrick floor until there is hardly room enough for one man to stand, much less four. Such a condition as this picture shows increases the stumbling hazard that interferes with the efficiency of workmen and at the same time places them in much danger. "A place for everything and everything in its place,' is a motto which would do away with nearly all "poor housekeeping." Such a motto put into practice would also have a big share in promoting efficiency on the derrick floor like the one shown in the picture without getting tangled up in something, and imagine the result if he had to get hold of some piece of equipment in a hurry!



A good example of "poor housekeeping." Besides minimizing efficiency in the regular work on the derrick floor, many hazards are created by such a confused arrangement of equipment. A slight jar would cause the board to fall and anyone walking on it would find himself in a sea of mud.

West Texas Wildcat Starts Making Flow

Ft. Worth, Texas, Jan. 9.—The wildcat oil producer in Reagan County section of West Texas began flowing through the six and five eighths casing last Saturday after being off the pump a short while owing to the accumulation of paraffin in the tubing, and indicates that it is just as good a producer when it was completed last May at 3026 feet. This well is owned by the Big Lake Oil Company which has two nearby tests in close striking distance to the pay level, with one shutdown at 2938 feet pending the arrival of a string of five inch casing reported lost while en route from Ranger.

Tulsa, Okla., Jan. 8.—March Oil Company and Phoenix Refining Company have been consolidated into the Regal Oil and Gas Company, effective as of January 1, last.

Little Doing in Arkansas Account Weather Conditions

El Dorado, Ark., Jan. 7.—The Hope Columbus Oil Company is preparing to set a string of five and three-sixteenths inch casing on a canvas wall packer for the purpose of making a test of five feet of sand logged at a total depth of 2107 feet in its No. 2 King, in section 24-11-25, near Washington, in Hempstead County. Meyer et al are temporarily shut down at a depth of 2170 feet in their No. 1 Nicholls, in section 17 of this same township.

The Lewisville (Fullilove) Syndicate is drilling at around 2125 feet in their Osborne wildcat, section 16-15-24, near Lewisville in La Fayette County. Wilburn and others have begun drilling with cable tools, and are down below 300 feet in their No. 1 Hughes, which is located in section 21-19-23, La Fayette County, about seven miles north of Spring Hill, Louisiana, near the border.

CRUDE AND REFINED MARKET QUOTATIONS

Dec. 27.—The Gulf Pipe Line Company, early today started posting a price on Mexia, Currie and Corsicana-Powell crudes. The Company will pay the Texas Company's price of $1.25 per barrel.

Jan. 3.—Effective today the Imperial Oil Company advanced the price of Canadain crudes ten cents.

Jan. 7.—The Joseph Seep Purchasing Agency advanced New York Transit and Bradford District crudes 15 cents to $3.40 and Corning crude 15 cents to $1.55.

Jan. 9.—Effective early today the Magnolia Petroleum Company posted the following prices for fields in Oklahoma, Kansas and Texas where they are buying on a gravity basis: Below 28 gravity, 50 cents; 28 to 30.9 gravity, 75 cents; 31 to 32.9 gravity, $1.00; 33 to 35.9 gravity, $1.25; 36 to 38.9 gravity, $1.40; and $1.50 for 39 gravity and above.

Jan. 9.—Early today the Prairie Oil and Gas Company posted the following new prices for Mid-Continent crudes: Below 33 gravity, $1.00; 33 to 35.9 gravity, $1.25; 36 to 38.9 gravity, $1.40; and $1.50 for 39 gravity and above. The Prairie's new prices were met by the Sinclair Refining Company.

Jan. 10.—Effective this morning the Standard Oil Company advanced the price of all grades of North Louisiana crudes 10 cents with the exception of Bellevue, which was increased 25 cents. Arkansas grades were also advanced 10 cents.

Jan. 10.—Effective this morning the Joseph Seep Agency advanced the price of Eastern crude 25 cents. The new prices are New York Transit and Bradford districts $3.65, all Pennsylvania grades $3.25, Cabel $1.60, Somerset medium $1.60 and Somerset light $1.80.

Jan. 10.—Effective this morning the Ohio Oil Company advanced the price of Central States crude 20 cents. The new prices affect Lima, Indiana, Illinois, Princeton, Plymouth, Waterloo and Wooster crudes.

Jan. 10.—Effective today the Humble Oil and Refining Company advanced the price of both grades of Coastal crude 25 cents and also advanced the price of Mexia and Powell crudes 10 cents and Currie crude 15 cents.

Crude Oil Prices

EASTERN STATES

	Jan. 10 1924	Jan. 9. 1923
New York Transit	$3.65	$ ...
Bradford (Pa.)	3.65	...
Other Pennsylvania grades	3.25	3.25
Cabel	1.60	2.11
Ragland	.75	1.00
Corning	1.55	1.75
*Somerset, heavy	1.60	1.96
*Somerset, light	1.80	2.21

*Six cents above posted price since October 1, 1922.

CENTRAL STATES

	Jan. 10 1924	Jan. 9. 1923
Illinois	$1.62	$1.77
Indiana	1.63	1.78
North Lima	1.83	1.98
South Lima	1.83	1.98
Plymouth	1.00	1.15
Princeton	1.62	1.77
Lodi	1.50	...
Waterloo	1.10	1.25
Wooster	1.70	1.90
Western Kentucky	1.20	1.65

MID-CONTINENT

(Prairie prices posted 1-9-24)

Below 33 gravity	$1.00	....
33 to 35.9 gravity	1.25	....
36 to 38.9 gravity	1.40	....
39 gravity and above	1.50	....

(Magnolia prices posted 1-9-24)

Below 28 gravity	$ .50	....
28 to 30.9 gravity	.75	....
31 to 32.9 gravity	1.00	....
33 to 35.9 gravity	1.25	....
36 to 38.9 gravity	1.40	....
39 gravity and above	1.50	....

(Humble Oil & Refining Company's Prices posted 12-27-23)

39 gravity and above	$1.40	...
36 to 38.9 gravity	1.30	...
33 to 35.9 gravity	1.15	...
30 to 32.9 gravity	1.00	...
Below 30 gravity	.90	...

(Texas Company's Prices posted 12-27-23)

39 gravity and above	$1.40	...
36 to 38.9 gravity	1.30	...
33 to 35.9 gravity	1.15	...
Below 33 gravity	.90	...

NORTH CENTRAL TEXAS

Corsicana (light) (Magnolia)	$1.25	...
Corsicana (light) (other companies)	1.25	...
Corsicana (heavy)	.50	...
Thrall	1.00	...
Powell	1.35	...
Mexia	1.35	...
Currie	1.50	...

SOUTH TEXAS

Rockdale-Minerva	1.00	1.50
Mirando	.75	...

SOMERSET

(Posted by Grayburg Refining Co.)

32 gravity and above	$1.00	...

Below 32 gravity, five cents reduction for each decrease of one half degree.

GULF COAST

All grades except Grade B at Blue Ridge and Pierce Junction	1.50	1.25
Blue Ridge (Grade B)	1.15	.80
Pierce Junction (Grade B)	1.15	.80

LOUISIANA-ARKANSAS

Caddo

	Jan. 10 1924	Jan. 9. 1923
38 gravity and above	1.35	...
35 to 37.9 gravity	1.25	...
32 to 34.9 gravity	1.15	...
Below 32 gravity	1.00	...

Homer

35 gravity and above	1.75	...
33 to 34.9 gravity	1.25	...
31 to 32.9 gravity	1.15	...
Below 31 gravity	1.00	...

Haynesville

33 gravity and above	1.25	...
Below 33 gravity	1.15	...

Bull Bayou

38 gravity and above	1.30	1.40
35 to 37.9 gravity	1.15	1.30
32 to 34.9 gravity	1.00	1.25
De Soto crude	1.35	1.60
Critchton	1.05	1.25
Bellevue	1.15	.75
Jennings	1.25	1.25
Vinton	1.25	1.25
Edgerly crude	1.25	1.25

Smackover

26 gravity and above	$1.00	$ ...
25 to 25.9 gravity	.85	...
24 to 24.9 gravity	.75	...
Below 24 gravity	.65	...

El Dorado

33 gravity and above	1.35	...
Below 33 gravity	1.25	...

Stephens District (Atlantic)

(Posted by Atlantic Oil Company 12-29-23)

28 gravity and above at 60 degrees	$ .95	...
26 to 27.9 gravity at 60 degrees	.90	...
23 to 25.9 gravity at 60 degrees	.75	...
Below 23 gravity at 60 degrees	.55	...

WYOMING-MONTANA

Wyoming

Elk Basin	.95	1.50
Grass Creek	.95	1.50
Rock Creek	.60	1.15
Lance Creek	.90	1.50
Mule Creek	.45	.90
Big Muddy	.45	1.05
Salt Creek	.60	1.05
Osage	.90	1.50
Hamilton Dome	.95	....
Pilot Butte	1.10	....
Landers	1.10	.70
Torchlight-Greybull	.95	....

Montana

Sunburst	.70	.70
Cat Creek	.95	1.50

CALIFORNIA

(Crude Oil Prices at the Well)

Los Angeles and Orange Counties

14 to 19.9 gravity	.60	.60
20 to 20.9 gravity	.61	.63
21 to 21.9 gravity	.62	.67
22 to 22.9 gravity	.63	.73
23 to 23.9 gravity	.64	.80
24 to 24.9 gravity	.65	.88
25 to 25.9 gravity	.66	.96
26 to 26.9 gravity	.67	1.05
27 to 27.9 gravity	.68	...
28 to 28.9 gravity	.69	...
29 to 29.9 gravity	.70	...
30 to 30.9 gravity	.71	...
31 to 31.9 gravity	.72	...
32 to 32.9 gravity	.73	...
33 to 33.9 gravity	.74	...
34 to 34.9 gravity	.75	...
35 gravity and above	.76	1.85

CANADIAN CRUDE

*Petrolia	2.03	2.38
*Oil Springs	2.25	2.45

*Plus 52½ cents bounty.

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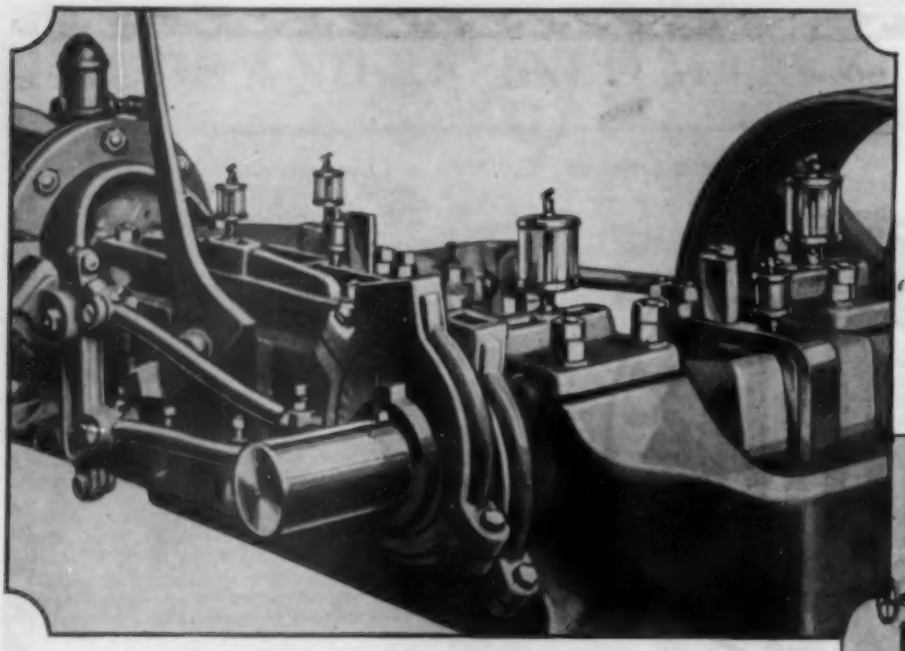

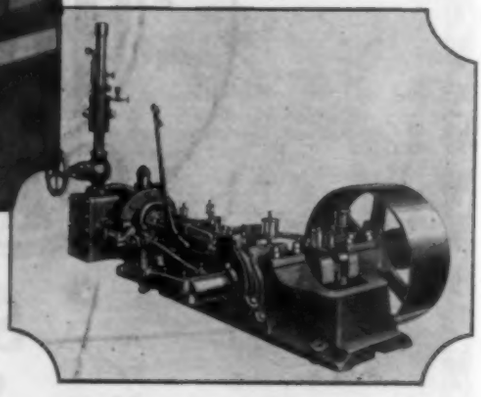

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AJAX DRILLING ENGINES

TABLE II
Amount and composition of gases absorbed by water from different sources

Sample No.	Sample of water	State	County	Temperature °F.	c.c. of gas (124° C. and 745 mm. Hg.) in one liter of water	Composition of gas removed, per cent by vol. CO_2	O_2	CH_4	C_2H_4	N_2	Remarks
1	Well	Pa.	Westmoreland	54	40.4	41	0	0	0	69	Near Renton, Pa.; Texas oil field. Well 30 feet deep; used only for watering stock on farm.
2	Spring	"	"	51	260.0	16	23	0	0	61	Near Renton, Pa.; Texas oil field. Shallow spring water flowing from side of hill.
3	"	"	Clarion	49	19.6	19	..	0	0	..	Four miles west of Rimersburg, Pa. Shallow spring water.
4	"	"	"	50	22.2	19	12	0	0	69	Six miles west of Rimersburg, Pa. Shallow spring water.
5	"	"	Armstrong	50	29.7	25	14	0	0	61	Eight miles east of Ford City. Shallow spring water.
6	"	"	"	51	23.9	2	25	0	0	73	Four miles west of Rural Valley. Shallow spring water.
7	Well	"	Butler	50	19.2	3	2	0	0	95	Well in city of Butler, Pa., 60 ft. deep.
8	"	"	"	..	34.0	5	6	21	0	68	Valencia, Pa. Water from feed to hot water system.
9	"	"	"	..	32.8	11	7	21	0	61	Well 200 ft. deep. Taken from well supplying water to No. 8.
10	Spring	"	"	50	25.7	2	3	0	0	95	Eight miles west of Worthington, Pa. Shallow spring water.
11	"	"	Jefferson	51	30.5	25	23	0	0	52	Two miles east of Corsica, Pa. Shallow spring water.
12	"	"	"	50	39.0	38	5	0	0	57	Four miles south of Brookville, Pa. Shallow spring water.
13	Salt	"	Westmoreland	78	24.1	35	0	12	26	47	Near Renton, Pa.; Texas oil field. Salt water separating from crude being pumped from producing well.
14	"	"	"	97	12.1	0	0	44	10	46	Near Renton, Pa.; Texas oil field. Salt water from drilling well 3700 ft. deep.
15	Well	Mich.	Barry	57	30.0	11	1	0	0	88	30 ft. deep.
16	Spring	"	"	55	19.3	12	0	0	0	88	Shallow spring water.
17	Well	"	"	53	39.6	58	1	0	0	41	75 ft. deep. Several muddy lakes nearby.
18	Pond	"	"	76	16.6	0	15	0	0	85	Muddy pond water sampled close to shore.
19	Lake	"	"	79	17.0	2	18	0	0	80	Lake water sampled 50 ft. from shore and 3 feet below surface.
20	Artes.	Ohio	Stark	..	45.8	9	(C_2H_4) 15		7	69	Well originally drilled for oil but produced water. Flowing for 15 years near Howanstine, Ohio.
21	Well	"	"	..	33.5	38	0	0	0	62	One mile west of East Sparta, Ohio. Well about 400 ft. deep, water discolored.
22	"	"	"	..	29.4	10	0	4	0	86	Well in East Sparta, Ohio, about 200 ft. deep.
23	"	"	"	..	38.2	18	5	0	0	77	Well in East Sparta, Ohio. Dug well 35 ft. deep, 2 ft. diameter. About 10 ft. of water in it.
24	"	Mont.	Rosebud	53	44.4	4	0	37	0	59	Locke Twp. See 36 T-7N; R44E. Flowing well.
25	"	"	"	55	62.1	3	0	66	0	31	S. E. ¼ S 6 T-6N; R43E. Carterville, Mont., Flowing well.
26	"	"	"	53	55.6	2	0	60	0	38	N. E. ¼. See 2dT-6N; R42E. Flowing well.
27	"	"	"	55	60.9	3	0	60	0	37	SW¼. See 4; T-6N; R43-E. Thurlow, Mont. Flowing well.
28	"	"	"	54	61.9	3	1	66	0	30	SE ¼ See2 T6-N. R42E. Flowing well.
29	"	"	"	55	64.2	3	0	60	0	37	Montana Twp. N. E. ¼ See 11; FnR 43 E. Flowing well. Thurlow, Mont.
30	"	"	"	54	45.9	4	2	58	0	36	Carterville NE ¼; See 9T-6N; R42E. Carterville, Mont. Flowing well.
31	"	"	"	52	46.6	5	0	58	0	37	SW ¼ See 14-T6N-R42E; Flowing well.
32	"	"	"	53	33.2	2	3	0	0	95	SW ¼ See 35T7N-R41E. Forsythe, Mont. Water tasted more alkaline than the samples above.
33	"	"		52	29.3	3	1	0	0	96	S. E. ¼ See 10-T6N-R41E. Forsythe, Mont. Noticeable odor of sulphur.

Gas Content of Water Aids in Finding Oil

(Continued from page 16)

the gas is necessary from which the total volume of gas can be calculated.

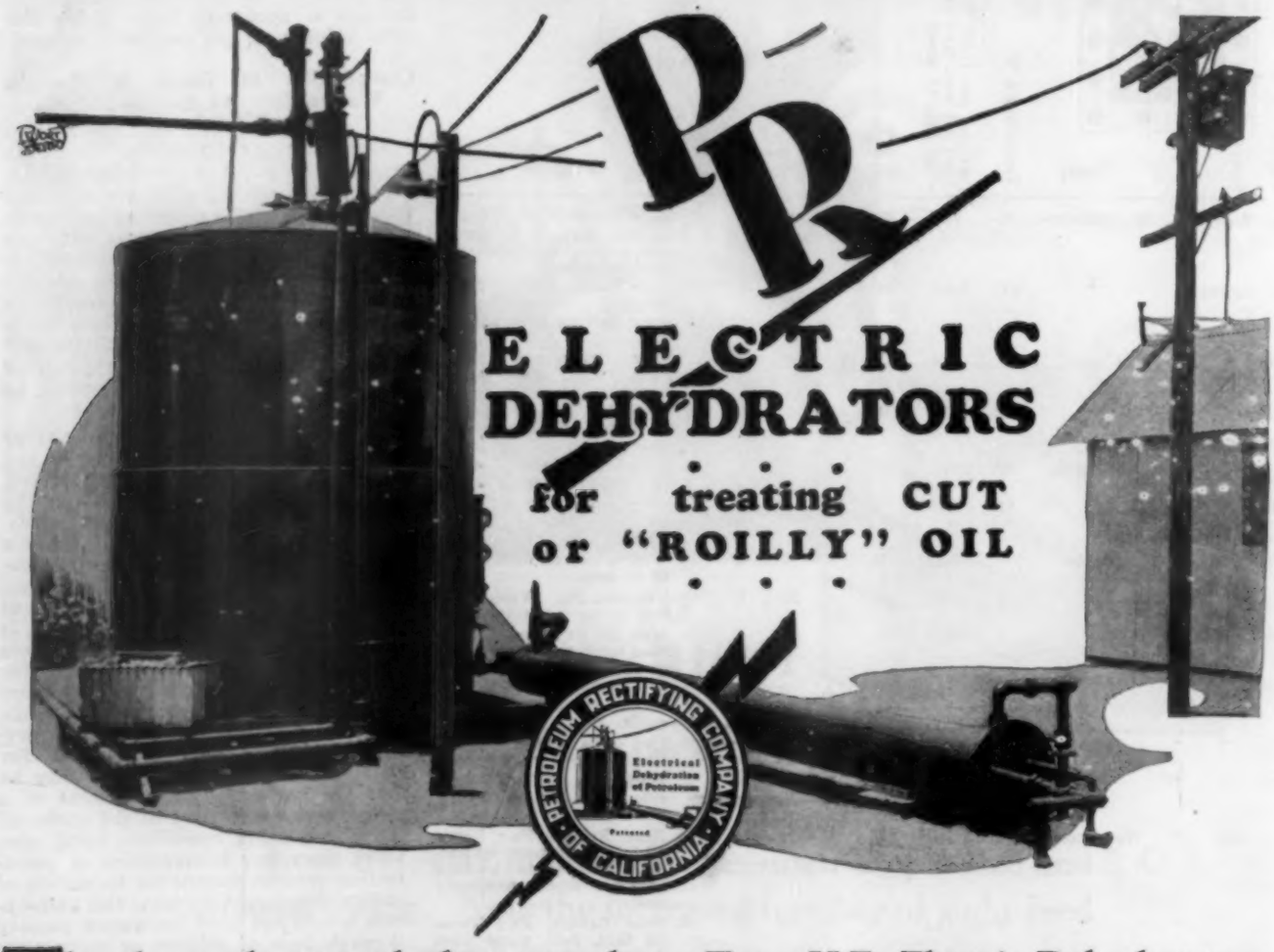
Composition of Gases in Certain Waters Sampled and Deductions Therefrom

To determine the practicability of the apparatus and the significance of the gases found absorbed in underground waters, samples of spring, well, and salt waters were collected from different localities and tested for gaseous content. The larger number of the samples were collected from western Pennsylvania, a region in which there are a great number of producing oil and gas sands. A few others were collected from Michigan, Ohio, and Montana, as indicated in Table 2.

It will be noted that no methane or hydrocarbon vapors were found in any of the shallow spring waters tested, showing these waters to be above the caprock sealing the producing sands. These results indicate that shallow spring water is of no value for the detection of petroleum and natural gas. The gases from these waters consist of carbon dioxide, oxygen, and nitrogen. It might be mentioned that those waters which were considered the best for drinking purposes contained smaller percentages of carbon dioxide, while No. 1, which contained the highest percentage (41%) was used only for watering stock on a farm. It may be that the carbon dioxide content of a spring water indicative of the purity of the water, other conditions being constant, since any fermentation or putrefaction process causes the formation of carbon dioxide. Of course this assumption would not hold for waters passing through beds of calcium or magnesium carbonate.

Two of the well waters tested (No. 8 and 9) which were from a moderate depth (200 feet) gave from 19 to 21 per cent methane in the dissolved gases. These waters were taken in a region in which there were several producing natural-gas wells.

To obtain waters of a deeper origin, two salt waters were tested. One (No. 13) was the salt water which separated from the crude oil in the separating tanks as it was pumped from the well. The gases evacuated from the water contained combustible vapors in the proportions of about two volumes of ethane to one of methane. Gases of this general composition indicate the presence of crude-oil vapors. Salt water No. 14 was taken from the bottom of a well being drilled, which at the time the sample was taken, was down 3700 feet. Several light natural-gas sands had been penetrated in the drilling and a small amount of natural gas was continually being liberated out of the top of the hole. This sample contained natural gas, some of which undoubtedly was absorbed by the salt water as it was being bailed from the bottom to the top of the well. Whether the hydrocarbons found in this salt water resulted from contact with oil and gas sands at a lower level is questionable. At any rate, the indication is that the quantity of hydrocarbon vapors found in the salt water is more than would be dissolved in the water due to the short time of contact of the water with the gases while the



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water was being bailed to the top from the bottom of the hole.

Samples of water were taken from ponds, lakes, and wells in Michigan. The well waters were desired to determine whether any combustible gases would be present from a region in which petroleum and natural gas has never been found. These waters gave no indications of hydrocarbon gases, indicating at least the absence of oil or natural-gas sands. The waters were of only moderate depth, so water of deep sources might give altogether different results. The samples of pond and lake waters were taken from places where there were muddy bottoms to determine whether waters of this source would not liberate sufficient marsh gas (methane) which might be confused with true natural gas or petroleum vapors; but the results of these analyses show that hydrocarbon vapors were not present in detectable quantities. In other words, any methane which might have been liberated from the muddy organic material in the bottom was so small compared to the large volume of water present that the quantities were too small to be detected.

A few well waters were taken in Ohio and the shallow wells (samples No. 21 and 23) indicated that hydrocarbons were not present, while those of a deeper origin (No. 20 and 22) indicated 4 to 22 per cent. The sample showing 22 per cent was from an artesian well which originally was drilled for oil. A large area of fresh water was struck, and drilling was stopped. The hydrocarbons present indicate petroleum rather than natural gas. Whether these hydrocarbon vapors were absorbed in the immediate vicinity or at a distance from the well is not certain. At any rate, the water has apparently traversed an area of hydrocarbon producing sand, as shown by the gases present. In the district where this well is, are producing wells within 20 miles.

Through the courtesies of W. D. Collins and B. Coleman Renick of the U. S. Geological Survey, several samples (24 to 33 of Table 2) were obtained from Montana. All but two of them contained large percentages of methane; in fact, they were practically saturated with this gas when calculated from the solubility coefficient of this gas in water at the temperature at which the samples were taken. Two of the samples (32 and 33) contained no methane, and from field observations they appeared to be of a different composition and from a different source.

The table gives the temperatures of the waters when sampled, and for shallow waters the temperatures are fairly constant, varying from about 49 to 55° F. Waters of deeper origin are naturally higher, due to increased rock temperature with depth. In a general way there is about 1° F. rise in temperature for every 60 to 120 feet distance under ground, as has been proved in mining operations. In other words, the temperature of the water sampled at the surface gives an approximation of the depth of origin of the water.

Methane in Hot-Water or Steam Heating Systems

The use of waters containing dissolved methane in inclosed hot-water and steam-heating systems presents dangers which heretofore may not have been considered. When heated, water that contains dissolved methane liberates the gas due to reduced solubility of gases at elevated temperatures. If **waters similar to the above** are used in enclosed circulating systems there would soon accumulate large quantities of methane in the upper parts of the system, over the water. Unless this gas is vented off, additional fire hazards are produced thereby. In fact, when explosions occur in heating systems, the greater damage may be due to the ignition of the large amounts of methane liberated. Samples of water were taken from a hot-water heating system which used the above water, (samples 8 and 9, Table 2) and the dissolved gases were found to contain over 80 per cent methane. Acid waters in contact with iron produces hydrogen, however, this gas was not detected in any of the waters mentioned herein.—Reports of Investigations, Department of Interior, Bureau of Mines.

HUMBLE GUN CLUB

Houston, Texas, Jan. 9.—A gun club has been organized in Houston by employes of the Humble Oil and Refining Company for employes only. The Lawrence Cove Gun Club, as it is called, has leased a piece of property at Lawrence Cove, where the ducks are reputed to come thick and fast. At a recent meeting the following were elected to hold office: J. R. Davis, Houston, president; W. R. Black, Goose Creek, vice president; V. E. Davis, Houston, secretary and treasurer. It was also decided that the club's membership would not exceed 50 and the quota is not far from being filled.

RECEIVER'S SALE

Wichita, Kans., Jan. 7.—Announcement has been made of a public sale to be held here February 4 to dispose of the properties of the Union Oil Company of Kansas. The company has been in the hands of C. H. Smythe, receiver, for more than a year.

Production of Petroleum

The figures given below for the States east of California, compiled from reports made by pipeline companies to the Geological Survey, show the quantity of petroleum transported from producing properties. Petroleum consumed on the leases and produced but not transported from the producing properties is not included in the preliminary figures. These items are given in the final statistics, which show gross production—all the oil brought to the surface. The figures for California are those reported by the Pacific Coast office of the American Petroleum Institute and show gross production. Figures for 1923 are subject to revision, those for 1922 are final and include oil consumed on the leases and net increase of producers' stocks.

BY STATES
(Barrels of 42 U. S. Gallons)

	October, 1923		November, 1923			
State—	Total	Daily average	Total	Daily average	Jan.-Nov. 1923	Jan.-Nov. 1922
Arkansas	3,046,000	98,258	2,723,000	90,767	31,899,000	11,079,000
California	24,576,000	792,787	22,398,000	746,595	241,829,000	123,174,000
Colorado	5,200	168	5,700	190	62,500	89,500
Illinois	733,000	23,645	695,000	23,167	8,026,000	8,657,000
Indiana:						
Southwestern	64,000	2,065	62,000	2,066	733,000	781,000
Northeastern	28,000	903	18,000	600	233,000	221,000
Total Indiana	92,000	2,968	80,000	2,666	966,000	1,002,000
Kansas	2,166,000	69,871	2,378,000	79,267	25,839,000	29,318,000
Kentucky	686,400	22,142	627,400	20,913	7,434,000	8,293,200
Louisiana:						
Gulf Coast	187,000	6,032	181,000	6,033	2,073,000	1,571,000
Rest of State	1,674,000	54,000	1,605,000	53,500	20,450,000	31,241,000
Total Louisiana	1,861,000	60,032	1,786,000	59,533	22,523,000	32,812,000
Montana	192,000	6,194	138,000	4,600	2,383,000	2,207,000
New York	115,000	3,710	106,000	3,533	1,140,000	920,000
Ohio:						
Cent. & Eastern	435,000	14,032	402,000	13,400	4,518,000	4,355,000
Northwestern	190,000	6,129	172,000	5,733	1,990,000	1,872,000
Total Ohio	625,000	20,161	574,000	19,133	6,508,000	6,227,000
Oklahoma:						
Osage County	*2,700,000	87,097	2,356,000	78,533	34,691,000	34,480,000
Rest of State	*9,055,000	292,083	10,018,000	333,939	112,848,000	101,726,000
Total Oklahoma	*11,755,000	379,180	12,374,000	412,472	147,539,000	136,206,000
Pennsylvania	632,000	20,387	565,000	18,833	6,710,000	6,828,000
Tennessee	600	19	600	20	7,000	8,800
Texas:						
Gulf Coast	2,348,000	75,742	2,129,000	70,967	27,178,000	32,337,000
Rest of State	12,555,000	405,000	13,029,000	434,300	88,426,000	77,470,000
Total Texas	14,903,000	480,742	15,158,000	505,267	115,604,000	109,807,000
West Virginia	579,000	18,678	482,000	16,067	5,905,000	6,441,000
Wyoming:						
Salt Creek	3,268,000	105,419	3,537,000	117,900	31,784,000	16,906,000
Rest of State	741,800	23,929	898,300	29,943	7,477,500	6,902,500
Total Wyoming	4,009,800	129,348	4,435,300	147,843	39,261,500	23,808,500
	*65,977,000	2,128,290	64,526,000	2,150,866	663,636,000	506,878,000

*Revised.

BY FIELDS
(Barrels of 42 U. S. Gallons)

	October, 1923		November, 1923			
State—	Total	Daily average	Total	Daily average	Jan.-Nov. 1923	Jan.-Nov. 1922
Appalachian	2,448,000	78,968	2,183,000	72,766	25,714,000	26,846,000
Lima-Indiana	218,000	7,032	190,000	6,333	2,223,000	2,093,000
Ills. & S. W. Ind.	797,000	25,710	757,000	25,233	8,759,000	9,438,000
Mid-Continent	31,196,000	1,006,309	32,109,000	1,070,306	314,153,000	285,314,000
Gulf Coast	2,535,000	81,774	2,310,000	77,000	29,251,000	33,908,000
Rocky Mountain	4,207,000	135,710	4,579,000	152,633	41,707,000	26,105,000
California	24,576,000	792,787	22,398,000	746,595	241,829,000	123,174,000
	65,977,000	2,128,290	64,526,000	2,150,866	663,636,000	506,878,000

Photo Taken at Stroud Field's Largest Well

FOR *8 YEARS* CLARK HAS USED WILLIAMSPORT LINES

The Stroud Field's second and largest well, brought in 2 hours before Christmas, with 1800 barrels initial production, is shown above. This well was drilled with Williamsport lines, under the supervision of J. L. Clark (right).

Mr. Clark is Superintendent and a partner in the firm of Miller & Tyrrell, drilling contractors, operating upward of 20 strings of tools in various fields. Richard Stanton, Assistant Superintendent, is shown at center, while at the left is G. H. Musgrave, the Williamsport Wire Rope Company's staff representative at Bristow.

For 8 years Mr. Clark's firm has used Williamsport lines. They have found WILLIAMSPORT Lines "absolutely satisfactory" and think that is about all they have a right to ask of any product.

There is a WILLIAMSPORT Line exactly suited, in material and design, to any oil industry condition. Our men are experts in "wire line science" and can advise you wisely when next you need a line.

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Federal Supply Co., Electra and Mexia, Texas
Sabine Supply Co., Orange, Texas.
Bovaird & Seyfang, Pittsburgh and Bradford, Pennsylvania.
Branchland Supply Co., Huntington, W. Va., Paintsville, Ky.
Dunham & Lawler, Los Angeles, Cal.
Montana Lumber & Hdw. Co., Lewistown and Winnett, Mont.

Drilling Development in English Fields

Just what recent prospecting has accomplished and how work is done

*By E. L. Ickes**

DURING the summer and winter of 1918 eleven standard rigs were erected in the United Kingdom to test the petroleum prospects of ten structures, eight of which were in England and two in Scotland. By the fall of 1921 ten of the wells were completed; the remaining one, the D'Arcy in Scotland, was stopped some months later. The tests were deep ones, five of the wells being 4000 feet or more, the rest varying in depth between 1810 and 3918 feet. The total footage drilled was 40,047 feet. The holes were put down with standard or cable tools purchased in the United States (except the bailers). The larger sizes of casing, 10-in. and above, were also from America, while the smaller sizes were secured in Scotland.

The Hardstoft well in England found a small production of high-grade oil and the D'Arcy well also encountered what is reported as a favorable showing at a depth of 1810 feet. The Werrington and West Calder wells had to be abandoned on account of drilling difficulties. The Apedale well encountered great thicknesses of ash in the Carboniferous and had to be abandoned on account of depth. The results might be summarized by saying that of the ten structures drilled upon, two yielded encouraging showings; three cannot be considered as having been adequately tested; and five produced dry holes, although in some of these small oil showings and gas were met.

The total cost of the work amounted to about half a million pounds sterling, which sum includes the cost of all equipment, subsequently sold to the government. The work, under the superintendency of V. L. Conaghan, took place for the most part in the period immediately following the war—a period of high prices, labor and transportation difficulties, and unsettled conditions generally; factors tending to retard the work and affect the costs.

The writer, as a member of the staff of S. Pearson & Son, Ltd., had charge of the administration of the work during its later stages and therefore had recourse to the various details of operation. In this account he regrets being unable to enter as fully into a geological discussion as might be desirable, due to inability to consult the required references and notes.

During continuance of the drilling, progress reports were issued by H. M. Petroleum Department, and some accounts have appeared in publications of H. M. Geological Survey. The chief paper so far dealing with the subject is by Veatch,[1] and the present paper will in a measure supplement that.

The drilling campaign was undertaken as a war measure, for in 1917 the oil shortage for war purposes became so acute, because of the activity of the German submarines, that it was imperative to ascertain as soon as possible the value of home oil prospects. The firm of S. Pearson & Son had been looking into the oil question for some time and was at this period intending to drill several test wells. In the summer of 1917, the Government, on account of the firm's knowledge of the oil business and the information it had collected on British oil, approached Lord Cowdray, the head of the firm, with a view to immediate drilling as a war measure, and proposed taking up the work itself if Lord Cowdray was not prepared to do so. At this time the British Government was spending nearly eight million pounds sterling daily in the prosecution of the war, in comparison to which the cost of a few test wells would be small while the results, if successful, would be of the greatest value to the nation. Accordingly, Pearsons were made agents and given the supervision and direction of the work (the services being without compensation), and men and machinery ordered from America. For drilling purposes, it was necessary to take the sites under Defense of the Realm Act, which were war regulations of a temporary nature. The wells were scattered, to try out various conditions. Most of the wells were not going until shortly after the Armistice, and the ending of the war altered the plan of drilling campaign. The results achieved justified the undertaking and expenditure incurred. Oil was proven; and although it was not possible to extend and develop the findings brought forth by the drilling on account of the limitations under which the work was done, the tests were of a comprehensive nature and will afford a valuable guide in future prospecting. In a country like Great Britain, and its large population, excellent transportation, ready oil market, mild climate, and other facilities, a small well is more apt to be a commercial proposition than a similar well in other countries. What might be considered as unfavorable aspects from the wildcatter's standpoint are the difficulty in the way of securing land readily and the obstacles liable to be encountered from the mining interests, who would not view any too kindly the location of a well near a mine workings.

General Geological Features

The English wells were located in the Midlands, an important industrial region occupying the heart of England about 125 miles northwest of London. In point of superficial distribution and structure, England may be divided into two parts: the flat-dipping Mesozoic and Tertiary rocks covering the eastern, southeastern, and southern portions of the country and the outcrops of Carboniferous and older rocks, which form the western and northern portions. The older areas show more deformation and usually give rise to a more rugged topography. Belts of Mesozoic also occur in the older rocks and a notable depression filled with the younger formations crosses the country, in a northwesterly direction, through the south Midlands, Cheshire and Liverpool, and separates the older rocks of Wales from those of central England.

As would be expected, the two groups are separated by a marked unconformity. Borings started in the Mesozoic, on reaching the Paleozoic floor beneath, sometimes encounter Carboniferous, as in the case that led to the discovery of the concealed Kent coal field southeast of London; or the drill may strike Devonian, Silurian, or other formations, which make up the floor upon which the younger rocks are resting.

The outcropping rocks of the north of England are moderately deformed Carboniferous. Along the Scottish border, these are interrupted by a wide belt of highly folded Silurian with a northeasterly trend; beyond this belt in central Scotland, the Carboniferous reappears in an isolated basin in the vicinity of Glasgow and Edinburgh. On account of this interruption in their continuity, there is some difficulty in correlating the Carboniferous members of the two countries.

All the borings started, and presumably ended, in the Carboniferous. Those in England were in two groups: one on the east side of the Pennines in Derbyshire, the other on the west side in North Staffordshire. The Scottish wells were located in the Carboniferous basin near Edinburgh.

The Pennine Chain is sometimes referred to as the "backbone" of England. It starts north of Derby, coincident with the appearance of the Carboniferous, and continues north through the mid-portion of the country to the borders of Scotland as a series of hills and tablelands rarely attaining an elevation over 2000 feet.

Indications of Petroleum

Oil manifestations of various types can be said to be of general occurence in certain districts of the United Kingdom. They range in character from veinlets and fragments of bitumen and wax through outcropping oil sands to actual seepages. At some place or other, practically every formation from the per-Cambrian to the Cretaceous can be found to contain one or more of these types. A characteristic of most of the fluid varieties from the Paleozoic is the high wax content, causing the oil to set at ordinary temperatures. Many occurences have been discovered in coal and lead mining operations, from early times; most of the indications have been found associated with the Carboniferous and most of these are located in the Midlands and Scotlands. We will begin the description of some of the occurences with Derbyshire.

At Riddings colliery, situated on the crest of the fold tested by Ironville well No. 1, oil was found in the Kilburn

[1]A. C. Veatch: Petroleum Resources of Great Britain. Trans. (1921) 65, 7.

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coal workings of the lower coal measures. For several years, about 1850, James Young utilized this oil and separated such fractions as kerosene, lubricating oil, and wax. On the exhaustion of the supply, either through abandonment of the workings or cessation of the seepage, Young, believing the oil was derived from coal, experimented with Scotch torbanite, which gave somewhat analogous products on distillation, and transferred his operations to Scotland and founded the oil-shale industry. It appears from an account by Marshall[2] that oil was found in the same mine and used locally about 20 years later but whether it was the same locality as that used by Young is not clear. The yield at this time was about two barrels per day for two years and near an important fault crossing the fold. Stokes[3] speaking of the same mine says that in some years 100 tons were obtained and sold for about $5 dollars per barrel. Another well-known seepage was located in the workings of Clowne colliery a few miles east of the Renishaw well. Here in a smashed zone between two faults in the Top Hard coal horizon of the productive coal measures seepages were found over an acre or so in area, the yield being reported as high as 14 barrels per day at one time. Just north of the Derbyshire line, at Manvers Main colliery, a few miles northeast of Sheffield and situated on a broad anticlinal nose, large seepages were encountered some decades ago. According to Cohen and Finn,[4] the oil came from the roof of the Parkgate seam of the productive coal measures and for days the yield was 100 barrels per day of oil. Oil is reported from other collieries on this side of the Pennines, usually with faults. In the concealed coal field to the east, where the coal measures of Derbyshire dip under cover of the Mesozoic, a 13-foot oil sand was found in the Kelham boring in the Millstone Grits, and a 10-foot sand at the Retford boring in the coal measures, while prospecting for coal with the diamond drill. These oils were of the same character and were under sufficient pressure to force small amounts to the surface against a 3000 foot water column.

The upper part of the Mountain Limestone adjoining the west side of the Derbyshire coal field was at one time actively mined for lead and spar; in some of the workings pockets of oil were found, and in the overlying limestone shales enough gas to cause fatal explosions. Short[5] two centuries ago writing of the Hucklow Edge lead vein says that the vein for several miles was overlaid by a bed of boulder stones each yielding from one-half pint to one gallon of solf bitumen like Barbadoes tar, and that there were springs of oil in the mines which on catching fire would burn for days at a time. Pilkington[6] and Farey,[7] writing a century later of the mines in the same region, mention how the miners would burn the oil in their lamps and how the oil, covering the water in the mines and catching fire, would burn for some time and give rise to "burning springs."

Nor is surface evidence wanting that oil may have occurred in the upper limestone. The writer has seen more abundant evidence in the limestone of Derbyshire than in the Tamasopa limestone outcrops of Mexico. On the crest of the Crich dome, six miles west of the Ironville wells, Fig. 1, oil can be found filling vugs in the limestone. In the top of the limestone at Castleton, west of the Ridgeway well, is a large patch or seepage of elaterite and, in the same vicinity, gash veinlets filled with hard and soft bitumen and wax and cavities with oil can be found, especially around the ancient Odin lead mine, which has been worked from time to time since the days of the Saxons. Oil in this mine has been mentioned by various writers. Without reference to the other occurences on the east flank of the Pennines, we will mention a different type at Burton, 12 miles south of the town of Derby. A road cutting here exposes about 30 feet of flat Triassic sand stone, a good deal of which has a chocolate color due to oil and yields, by solvents, two and one-half per cent of petroleum, having the characteristics of Carboniferous oil. This horizon is traceable on the surface for one and one-half miles, and may at one time have been a well charged pool, derived through faults from the Carboniferous lying hundreds of feet below.

On the west side of the Pennines, in Staffordshire, at the Meir Hay colliery, well down on the flanks of the fold upon which the Werrington well was located, sufficient seepage oil was obtained to justify the erection of a small

[2] R. A. Marshall: Mineral Oil as found at the Deep Main Pits, Riddings, Derbyshire. Trans. N. Staff. Inst Min. Eng. (1879) 1, 126.

[3] A. H. Stokes: Economic Geology of Derbyshire. Trans. Chesterfield Inst. Eng. (1878) 6.

[4] J. B. Cohen and C. P. Finn: Pariffines from a Yorkshire Coal Seam. Jnl. Soc. Chem. Ind. (1912) 31, 12

[5] Dr. T. Short: The Natural Experimental and Medicinal History of the Mineral Waters of Derbyshire, Lincolnshire and Yorkshire. London, 1734.

[6] J. Pilkington: A View of the Present State of Derbyshire. London, 1789.

[7] J. A. Farey: General View of the Agriculture and Minerals of Derbyshire. London, 1811.

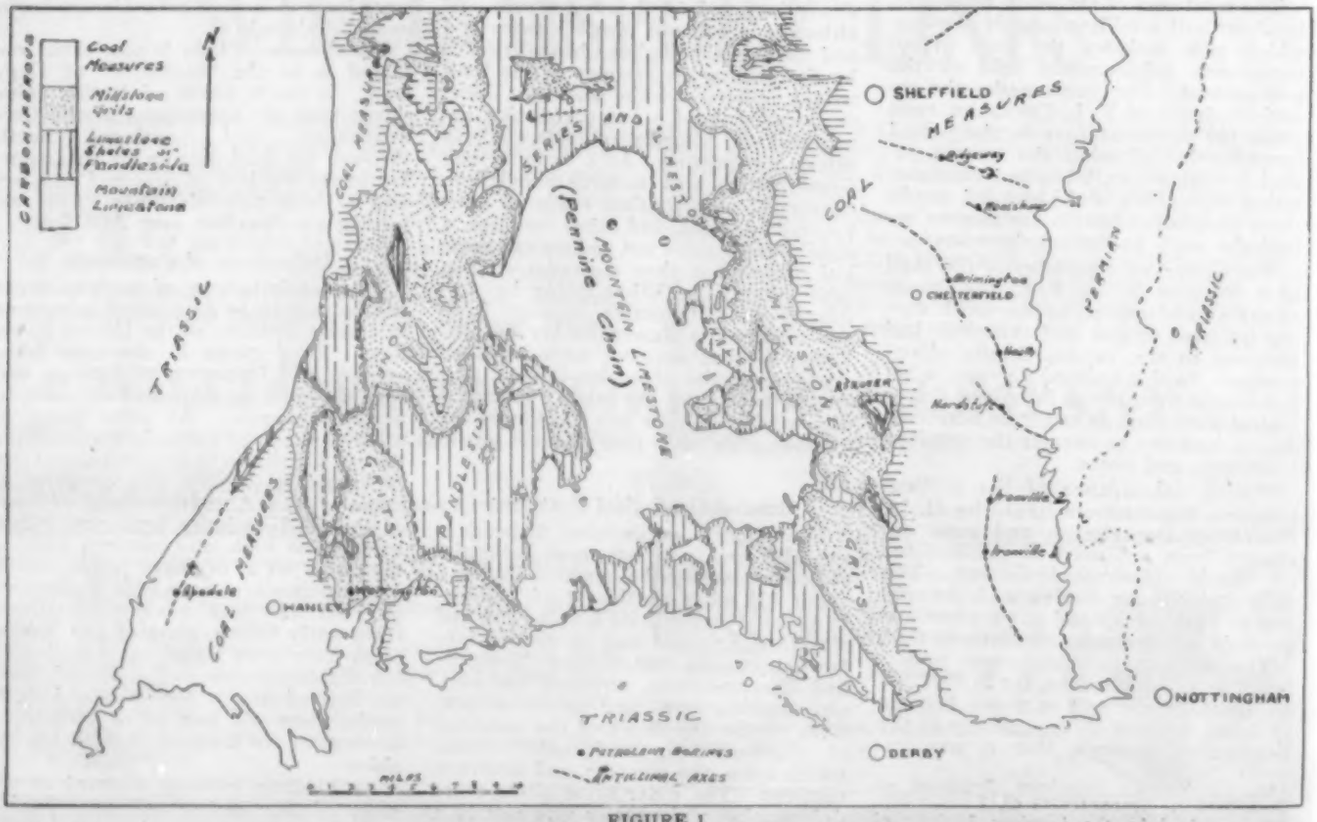

FIGURE 1
Geographical Map of portion of Midlands of England

PERFECTION VAPOR PRESSURE TANKS
WOOD, AND BOLTED STEEL TANKS

Indusputable Evidence No. 5

JOHN M. CAMERON, PRESIDENT
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Since the installation of this Combination Flow Tank and Separator, our fuel bill has been reduced as much as $50.00 per day, paying for itself the first 15 days of service. It has furnished gas for three Drilling Boilers and one Lease Boiler, a total of four boilers firing from this separator, also a gas engine and three lease dwellings.

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"Our fuel bill has been reduced $50 a day"

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Incidentally, it paid for itself in fifteen days!

And that's only one of the several items of superiority over other field storage tanks.

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Remember Perfections on installation will begin paying daily dividends

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Say you saw it in The Oil Weekly

refinery in 1874. The owner, a Mr. Walker[8] secured some five barrels per day for a year or two when the pits were closed down, after which he secured a like amount for a year or two from an adjoining colliery. The oil contained 15 per cent of wax and yielded a good grade of kerosene. On the west side of this coal field, small oil seeps are found in the coal workings on the east and south flanks of the fold drilled by the Apedale well. Samples collected during the work were charged with wax and were chemically similar to the limestone oils. A seepage from the Fair Lady pit, described by Peasegood,[9] and adjoining an overthrust fault, had a gravity of 37° Be. and carried four per cent gasolene, nine per cent kerosene, and five per cent wax.

In the worked-out Coalbrookdale coal field, 30 miles southwest of the North Staffordshire area and close to the border of Wales, the coal measures and lower Carboniferous are thin, moderately flexed, but considerably faulted. This district is noteworthy in the large amount of seepage material in evidence, as well as the written accounts dealing with the oil found in the past. Half a mile east of the village of Coalbrook-dale, at a quarry called Oil House Coppice, is exposed a tar sand over 15 feet thick oozing black oil and traceable a mile on the surface, the horizon being at the base of the coal measures. Under Coalport postoffice, in the same field, is an old mine level the walls of which are coated with thick oil and tar for hundreds of feet. A century ago, this seepage supplied oil for a remedy known as "Bettons British Oil," and in 1865 Mr. Holmes, an American, tried to lease the land for drilling purposes from Lord Forrester. Referring to a seepage a few miles to the east, where the sandstone still shows a little oil, Prestwich,[10] writing some hundred years ago, says: "In a pit at the top of the same dingle petroleum exudes in so great abundance * * * that the colliers were obliged to have large plates of iron suspended over them." From the Pitchford seepage, in the same general district, the Romans are reported to have secured pitch for the construction of their camp at Wroxeter, nearby. Eele,[11] writing over two hundred years ago, apparently refers to this place in describing a crude refining process on a "blackish stone which is porous and contains in it great quantities of bituminous matter." On treating this with boiling water the oil and pitch would collect on the surface and be skimmed off. The material was also used in later times for the remedy above mentioned. The seepage today is a pool of water covered with black oil, which is constantly collecting. The seep occurs in a small patch of pre-Cambrian on the crest of an anticline. The Carboniferous is found on all sides and covers the fold, and it was from quarries in this that the "blackish stone" was secured. In pre-Carboniferous rock, including pre-Cambrian, to the west of the Coalbrookdale coal field, tar and bitumen are found, but these can usually be ascribed to the presence, either now or formerly, of Carboniferous strata. Murchison[12] mentions some of these and appears to confound anthracite for bitumen as he describes one place (Lyth Hill) where the "anthracite" is viscid and runs out of the cavities in the state of mineral pitch.

In the important Lancashire coal field, located 40 miles north of the North Staffordshire district, colliery seepages are reported. The members of the Carboniferous become very thick. The coal field has some very large faults and the structural details are not well known. From here northward to Scotland, oil indications diminish, but interesting occurrences are found at Whitehaven, on the west coast, and in the Tees district, on the east coast.

Occurrences in the Mesozoic of the eastern and southern portions of the country are usually found in shallow water wells, used for domestic purposes, and as a rule are discovered during an unusually dry season when the water level is pumped down so as to bring up the contents floating on the surface; or in cases when the cover has been removed for repairing the well. The oil floating on these water surfaces is white to amber or light green in color, is mostly kerosene, but usually carries such fractions as light lubricating oil, some wax, and elaterite. The writer looked into several occurences, such as Gainsborough, Ramsey, Bassingbourne and Chobham. The Ramsey oil first appeared in the winter of 1917 and continued for at least four years, during which time some thousands of gallons were collected and sold. One explanation of these seepages is that the oil represents accumulation from surface storage, affected by the alteration of years of standing perhaps. But according to the chemical work done on samples by J. E. Hackford the oil in most cases is a true petroleum with Carboniferous affinities.

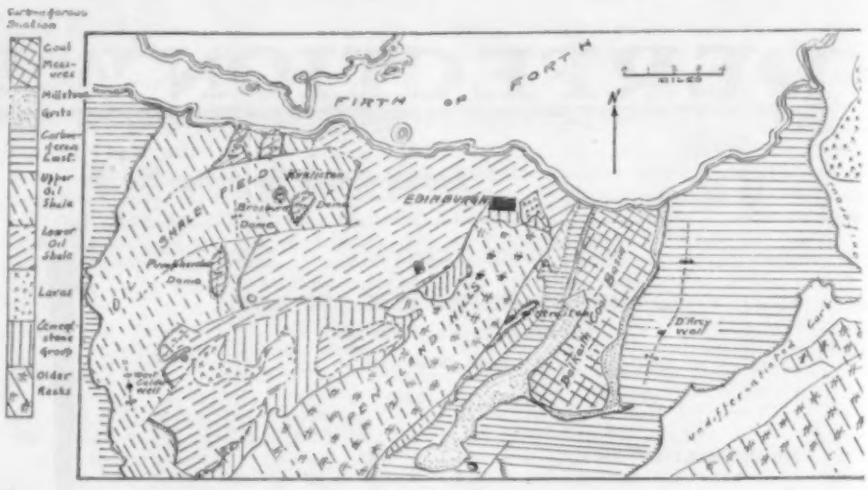

FIGURE 2
Map of geology in vicinity of Edinburgh, Scotland

The Scottish seepages are largely confined to the Carboniferous in the vicinity of Edinburgh, in which area the oil-shale fields are found. A few years ago, however, there was an important oil flow in a colliery 10 miles northeast of Glasgow and indications are reported in the Denonian of the north of Scotland. The Edinburg seepages are in the form of hard bitumen, wax, and oil. The oil-shale measures are intruded with sills and vents and it has been the custom to ascribe these products as due to heat effects of the intrusives on the oil shales. In the oil-shale mines, the hydrocarbons are found in both igneous and sedimentary rocks and, in chemical characteristics, are closely related to those of England. In the sediments of a pit on the flanks of the Broxburn dome, hundreds of barrels of oil with brine water were collected some years ago, and black waxy oil was collected during this work from the workings on the Pumpherston dome and at West Calder. East of the main oil-shale field is found the historic St. Catherines well, five miles southeast of Edinburgh in the direction of the D'Arcy well. By it size and appearance, this seepage would impress the average oil geologist at once. It is situated in Carboniferous rocks in the vicinity of a large fault separating these strata from the Devonian on the west. There is a pool of water covered with black oil and occasional rumblings of gas occur. The pool is protected by a stone house built, I believe, by one of the Stuarts, the place having been frequented in former times for medicinal treatment.

Mention should be made of the chemical correlation of the various seepage material collected during the investigation and carried out by Mr. Hackford. His chemical work checked the geological in indicating a lower Carboniferous derivation for the bulk of the material. His studies also enabled him to fortell closely the character of the crude ultimately found in drilling.

As to the significance of the various oil indications in the United Kingdom, this perhaps will not be well understood for some time to come. As some critics have maintained, are these indications of no value or do they indi-

[8]Wm. Walker: Petroleum in North Staffordshire. Pet. Rev. (1911) 24, 301.

[9]W. G. Peasegood: Discharge of an Inflammable Oil in a Coal Seam (Staffordshire). Trans. Inst. Min. Eng. (1909)) 35, 116.

[10]J. P. Prestwich: Memoir on the Geology of the Coalbrookdale Coalfield. Trans. Geol. Soc. (1836) 5, II, 413.

[11]M. Eele: On Making Pitch, Tar, and Oil, out of a Blackish Stone in Shropshire. Phil. Trans. (1697) 19. 544.

[12]Sir Roderick Murchison: The Silurian System. London, 1839.

cate that the country as a whole is a dead oil field and past hope of ever being commercially productive? Certainly at some former periods in the history of the country, valuable deposits must have existed, and the Hardstoft well should help invalidate the view that these deposits have all disappeared or become "inspissated." Any one acquainted with the hazards of wildcat drilling will acknowledge that eleven scattered wells are insufficient to test thoroughly a country having the size and geological conditions of the United Kingdom. The method of balancing the books by taking the difference between the cost of the prospecting to date and the return in oil sold, and writing it off as a loss is, if anything, premature. It would be more reasonable to let the balancing rest with the future, until more work may have been done.

Region of the English Wells

Geology—The core of the Pennine Chain to the west of the Derbyshire wells is made up of outcrops of the Mountain Limestone, or lower Carboniferous age. Opposite Sheffield, the Limestone dips under the Pendleside series and does not reappear again until some 40 miles farther north, whence it continues in the range to the Scottish border, gradually changing and becoming interbedded with shales, sandstone and coal seams. In the Derbyshire area, however, the formation is made up of at least 1500 feet of gray limestone, usually massive and, in the upper part, locally dolomitic. The base of the formation is not here exposed. On the eastern flanks of the range, the upper horizons contain local deposits of igneous rock of basic character, consisting of intrusives, contemporaneous flows and tuffs, and to these the name "toadstone" is applied by the lead miners. The development of igneous rock in the Carboniferous of England does not begin to reach the importance it does in Scotland.

Above the Limestone is found the limestone shale, Yoredale, or Pendleside, as it is variously called. In Derbyshire, this formation is made up of about 400 feet of black fissile shale with thin impure limestones, and is usually spoken of as the Yoredale or Limestone Shales. On the Staffordshire side of the range, the formation thickens greatly, develops sandy beds, and is referred to as the Pendleside.

Next in the section comes the Millstone Grits, a series of medium- to coarse-grained sandstones and grits separated by important shale members. On the east side, the thickness is about 1500 feet, while on the west side this thickness dwindles to a few hundreds of feet.

Resting on the Grits are found the Coal Measures, divided into the lower, or unproductive, and middle, or productive. Both members are largely argillaceous and sandstone beds are apt to be impersistent or wedge shaped. The lower measures are about 1200 feet thick, the middle several times this figure. The upper coal measures, reddish in color and poor in coal, are well developed on the Staffordshire side of the Pennines; but on the eastern side they have only recently been discovered in borings, concealed beneath the Mesozoic.

The Derhysbire coal field dips eastward under cover of the Mesozoic in Nottinghamshire to form a "concealed" coal field, now being actively prospected for coal by boreings and shafts. In this area, the top of the Carboniferous beneath the capping has been eroded into a remarkable peneplain, almost a geomatrical plain with a length, north and south, of over 100 miles and a width of at least 30 miles, dipping 75 feet per mile east.

Structure

The core of the Pennines, where the limestone outcrops, is in the form of a broad flexed dome developed on the Pennine uplift. On the flanks of this huge structure are found subsidiary folds, on some of which on the east and west sides the locations were placed.

In the area of the limestone core, the dips are moderate, as a rule, and the regional dip in general decreases in passing eastward across the Derbyshire coal field. That is, 10 degrees might be considered an average dip in the area of Millstone Grit outcrops, while on the east border of the exposed Derbyshire coal field the average may be closer to two degrees. Locally, however, in the coal field the dips become much steeped than this figure. On the Staffordshire side of the range, the deformation of the strata, both as to folding and faulting, is more intense than on the eastern flanks.

Faulting is an important feature in the structure of this part of England; in fact, faulting looms largely in the deformation of most parts of the British Isles. In Derbyshire, faults are of the normal type. Each square mile usually shows some sort of dislocation. The larger ones have a displacement of 100 yards or so, and some are traceable for half a dozen miles. In this east side coal field, there is a tendency for the faults to form in two systems, one paralleling the axes of folds or the structure contours, the other intersecting these at a high angle. In the faults on the long roll running northeast from Sheffield, this type of intersection is well developed, the angle of intersection approximating 60 degrees. In the Staffordshire coal field overthrusting is present, especially on the western side.

Fig. 1 shows that the folds on the west flanks of the Pennines have a general parallelism to the range, while in the less-deformed region of the east flanks this parallelism is absent, but the folds tend to radiate from a center lying west of Sheffield. There appears to have been some difference in the nature of the forces causing deformation on the two sides of the range. The generally normal-faulted condition of the east side suggests stretching of the crust with subsequent adjustments by the faults. The stretching might be due to localized radial or vertical forces acting upwards, resulting in the formation of the scattered folds and the type of faulting found. Such radial forces might arise from laccolithic action, or the subsidence of the strata along buried ridges of older rocks. The occurrence of thick toadstone deposits in the limestone of the Brimington well, and agglomerate in the core of the Ashover dome, suggests laccolithic action as the cause of some of these structures.

Particulars of the English Wells

The well logs given are based on samples taken every five feet and worked up in conjunction with the tower reports. Owing to lithological similarities, it is difficult to place the lower coal measure—Millstone Grit contact, and the Millstone Grit-Limestone Shale contact. The latter boundary is taken as the horizon where mica in the shales disappears. It will be noted that according to the correlations made there is a marked thickening of the formations northward. In the Ironville No. 1 well, the Grits have a thickness of 840 feet and the Limestone Shales a thickness of 180 feet. At Renishaw, 16 miles north, these have increased to 1420 feet and 660 feet respectively. There is a corresponding thickening of the lower coal measures. The structures, with the exception of Brimington, Ridgeway, Werrington and D'Arcy, were worked up in conjunction with information supplied by mining companies. The maps and publications of the Geological Survey were also found of great value during the investigations.

The two Ironville wells were on the same fold, No. 2 being two and one-half miles north of the other and several hundred feet lower on the structure. The fold is a well-defined dome, with a length of 8 miles from Langley Mills to Blackwell, and a closure of 500 feet or more. The dips vary round 5 degrees, but on the west flank, these steepen in places to 20 degrees.

No. 1 was placed on top of the dome close to the intersection of two faults, one trending with the axis and partaking of the nature of a sharp broken flexure; the other having a displacement of 90 yards and intersecting the first at right angles. The well started 50 feet below the base of the productive coal measures. The Grits were reached at 983 feet, the Limestone shales at 1840 feet, and the Limestone at 2031 feet. In the Grits at 1400 feet was a 50 foot sand with salt water and some black oil. At the top of the Limestone, a small showing was found yielding a barrel or so of oil of 30 degrees Be. At 2280 feet (in the Limestone), a thickness of 120 feet of toadstone was penetrated. For 600 feet below this, occasional colors of oil with gas were noted, the hole being full of water however. At 3600-3630 feet in the Limestone, the washed samples showed good tests for oil, 0.4 per cent by weight. The hole was full of water from horizons above. A shot of 180 pounds of dynamite was discharged and some time spent in endeavoring to shut off the water without success, leading to the abandonment of the hole.

No. 2 started in the productive coal measures, reached the lower coal measures at 760 feet, the Grits at 1680, the Limestone Shales at 2740, and Limestone at 3029 feet; 80 feet of toadstone was encountered in the same position as that at No. 1, and water horizons in the Limestone of the two wells coincide fairly well. Colors of oil were found in the Grits at 2170 and

(Continued on page 58)

PERSONAL MENTION-MEN YOU KNOW

Harry P. Davis, who scouts New Mexico, Utah and Arizona for the Sun Oil Company with headquarters at Gallup, New Mexico, was a visitor in the Dallas office of the company during the past week.

G. E. Wallis, editor of Natioanl Safety News was in Houston last week for a few days. He is making a tour of oil fields in the country to familiarize himself with conditions of safety in the petroleum industry.

J. V. McGinity, representative in Tulsa of the Wilson and Willard Manufacturing Company, is on a trip to the West Coast, where he will visit at the home office and plant of the company at Los Angeles.

Joe King of the Kingwood Oil Company was away from his offices in Okmulgee, Oklahoma, last week on a business trip to Tulsa.

Judge J. C. Denton of Tulsa, general counsel for Cosden & Company, has been recommended for appointment as federal judge for the eastern district of Oklahoma.

William I. Rosenfeld has resigned from the board of directors of the Middle States Oil Corporation with general headquarters in New York.

C. W. Board of Okemah, Oklahoma, has been appointed oil and gas agent for the Oklahoma school land commission, succeeding W. A. Durant.

General offices in Tulsa of the Chas. F. Noble Oil and Gas Company have been removed from the Kennedy Building to suite 608, New Wright Building.

Harry E. Gross, general superintendent of A. M. Byers Company, is away from his Pittsburgh offices on a business tour through the oil country.

P. C. Murphy, independent oil operator with headquarters at Tulsa, spent the past week inspecting his producing properties in Brown County, Texas.

R. B. Walthall, chief supervisor of the oil and gas division of the Texas Railroad Commission, has tendered his resignation, effective immediately, to accept appointment as a member of the State Board of Control, for a term of six years. No successor has been named by the Texas Commission to take Walthall's place.

H. H. Faulkner, president of the Nowata County Gas Company, has returned to Kansas City after a trip through Oklahoma.

F. P. Shayes, geologist, from Camden, Arkansas, is visiting in Houston for two or three days.

W. F. Radford, Houston representative for the Wm. S. Barnickle Company, returned to Houston from Louisville, Kentucky, last week. He was in Louisville in the interests of his company.

Jacob A. Gies, vice president of the Aldine Oil Company of Kenosha, Wisconsin, spent the past week in Wichita Falls looking after the interests of the company, which has production in the Clara pool in North Texas.

LIONEL T. BARNESON,
First Vice President and General Manager of the General Petroleum Corporation, one of the largest producing companies on the West Coast

W. B. Hamilton, president, and N. H. Martin, vice president, of the Texhoma Oil and Refining Company, returned to headquarters at Wichita Falls last Saturday from a 10 days' business trip to New York City. During the absence of these two officials from their offices, rumors were circulated in financial circles that the controlling interest of the Texhoma Oil and Refining Company had been sold, but have since proved unfounded, although the Producers and Refiners Corporation, Roxana Petroleum Corporation, White Eagle Oil and Refining Company, Magnolia Petroleum Company, and others, have considered the purchase of the Texhoma's holdings in recent months.

C. A. Warner, chief geologist for the Houston Oil Company in Oklahoma, is in Houston.

J. L. Shakely, sales manager of Frick-Reid Supply Company of Tulsa, is on a tour of inspection of the company's stores and branch shops throughout Louisiana, Texas and Arkansas.

Fred E. Watkins, vice president and general manager of the Iowa Oil and Refining Company and pioneer operator in the Healdton, Oklahoma, field, died at his home in Waurika, Oklahoma, recently.

E. A. Bacon has been appointed chief scout for the Roxana Petroleum Corporation with headquarters in Tulsa, succeeding C. B. McCormick, who has been transferred to the company's land department.

Milford Reed, employed by the Carter Oil Company in the Mid-Continent field, has gone to Buenos Aires to engage in oil development work for Standard Oil in the Argentine.

John S. Alcorn of the land department and S. Geyer of the geological department of Marland Oil Company of Ponca City, Oklahoma, are on the West Coast.

L. L. Stephens of Pierre, South Dakota, commander of the South Dakota department of the American Legion, has been appointed general attorney for the Standard Oil Company (Indiana), with headquarters in Chicago.

E. W. Marland of Ponca City, Oklahoma, head of the Marland Oil Company, is in New York in connection with a stock transaction pending with his company.

W. H. Gray of Tulsa, president of the National Association of Independent Oil Producers, addressed members of the Okmulgee District Oil and Gas Association at last Saturday's meeting at Okmulgee.

George A. Forman, president of the Southwestern Petroleum Company, has arrived in the Mid-Continent field from his home in Buffalo, New York, for an inspection of company holdings.

T. B. Hoffer, who recently resigned as vice president in charge of operations of the Producers and Refiners Corporation to rebuild the Fensland Oil Company, visited in Houston this past week. Mr. Hoffer's trip was made chiefly for the inspection of promising wildcat territory.

J. C. McCue, in charge of the producing department of The Texas Company in North Texas, paid a short visit to Houston recently.

R. F. Baker, formerly assistant chief geologist for The Texas Company, has recently been appointed chief geologist.

FIELD NOTES AND PRODUCTION STATISTICS

California Production Declines Continue

All fields are off and attention turns to Compton, where General Petroleum has sand

Los Angeles, Calif., Jan. 5.—The past week was a very quiet one for California, due to the Christmas holidays and also due to slump in drilling activity and decline in production. Every important field in Southern California showed a decline, the total decrease being around 27,000 barrels a day for the week.

Interest late in the week turned to the General Petroleum Corporation's No. 1 Gardena at Compton, the new field discovered by the Union Oil Company where only the discovery well is flowing. The General Petroleum's well is located on the edge of what has been thought to be outskirts of the new field. The sand was found around 4850 feet, more than a 100 feet deeper than found in the Union's discovery well. Casing has been cemented and it should be drilled out for a test some time next week.

No Big Production

It has been thought for some time, due to the action of outskirt wells, that the Union and Shell held practically all of the good acreage, but it now appears that the General Petroleum acreage to the north and west of the discovery well will be good. Leases in this new field are held in large blocks by the larger companies and there is no danger of a big production, unless it is needed.

CALIFORNIA FIELD OPERATIONS

The following table from statistics compiled by State Oil and Gas Supervisor R. D. Bush for California for the past several weeks gives a true insight into field activities:

Month ending—	New wells started	Water shutoff tests	Deepening jobs	No. wells aband.
*June	120	195	59	22
July	94	145	46	23
*August	96	141	41	26
Sept.	122	194	39	36
Week ending:				
October 6	24	28	10	9
October 13	26	36	8	4
October 20	23	33	10	7
October 27	41	34	10	5
November 3	23	37	15	1
November 10	17	37	11	10
November 17	32	45	7	5
November 24	28	32	15	7
December 1	18	41	7	9
December 8	15	44	5	10
December 15	26	32	10	5
December 22	23	36	5	1
December 29	23	28	10	7

*Five weeks in month.

C. S. Thomas, geologist, is authority for the opinion that the trend of the structure at Compton is nearly east and west, with the Union holding the cream of the structure. According to this view the General Petroleum lease is on the edge to the northwest, while the Julian property is off structure. Julian shut down operations at his well some weeks ago to await developments at other tests.

Latest reports from the new well on Rideout Heights near Whittier is htat the well is making about 2500 barrels of 32 gravity oil, in an uncompleted stage. Other wells will be drilled in this district, but there will be no big rush about it.

Torrance production the past week was off about 3,000 barrels, with 11 new producers having a total initial production of 6400 barrels. The drilling wells in the field now total 139, with 87 of this number drilling below 3000 feet. The Standard Oil Company's No. 1 Domingues, the outpost producer to the east, which came in making about 300 barrels a day, has increased to about 900 barrels, much to the surprise of the owners. It is also reported that the

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Imports of Petroleum at Principal United States Ports

The following figures represent the total imports of crude oil for the month with the current month given by weeks:

	Atlantic Ports						Gulf Coast Ports					
	Baltimore	Boston	New York	Philadelphia	Others	Total	Galveston	N. Orleans Baton Rge.	Port Arthur Sabine Pass	Tampa	Total	Total at All Ports
August	717,000	728,845	2,264,000	661,866	1,291,000	5,662,611	987,000	861,190	1,594,000	157,000	3,599,190	9,261,801
September	774,000	739,814	2,551,701	657,964	845,201	5,237,680	1,099,000	1,159,531	748,000	150,000	2,956,531	8,194,211
October	616,769	555,803	1,339,150	524,558	870,020	3,907,066	1,159,000	1,008,440	1,614,000	99,000	3,880,440	7,787,506
November	692,000	472,465	1,933,263	728,490	849,428	4,676,527	1,305,000	889,751	1,046,000	74,000	3,314,751	7,991,278
December	774,825	693,120	2,606,130	713,565	1,901,498	5,874,917	1,530,000	847,241	828,000	80,000	3,285,241	9,160,158
January	475,000	745,115	1,636,020	541,006	1,163,120	4,760,155	1,053,000	733,284	1,182,654	40,000	3,011,953	7,772,108
February	421,000	553,510	1,163,971	570,129	1,150,819	3,859,429	1,079,000	951,818	1,019,000	167,000	3,216,818	7,076,247
March	265,000	450,000	2,020,139	848,000	1,406,577	5,045,924	1,857,000	1,611,794	1,453,000	240,000	5,162,794	10,208,718
April	370,000	669,000	1,074,000	625,000	591,000	3,319,000	1,615,000	1,020,000	1,135,000	168,000	4,362,500	7,681,500
May	344,000	515,000	1,026,000	437,000	615,000	2,937,000	1,351,000	910,000	1,184,000	127,000	3,582,000	6,519,000
June	314,000	421,000	1,791,000	755,000	809,000	4,090,000	1,515,000	1,142,000	1,062,000	229,000	3,948,000	8,038,000
July	287,000	465,000	1,806,000	448,000	898,000	3,876,000	1,471,000	1,120,000	833,000	92,000	3,516,000	7,392,000
September	268,000	565,000	1,744,000	660,000	686,000	3,923,000	1,776,000	1,397,000	850,000	224,000	4,277,000	8,202,000
October	365,000	292,000	1,194,000	536,000	816,000	3,203,000	988,000	1,330,000	380,000	50,000	2,248,000	5,951,000
November	223,000	395,000	1,194,000	576,000	757,000	3,145,000	1,478,000	1,000,000	551,000	111,000	3,287,000	5,432,000
December 1	65,000	132,000	221,000	60,000	120,000	598,000	250,000	480,000	225,000	32,000	987,000	1,585,000
December 8	103,000	210,000	520,000	57,000	253,000	1,143,000	516,000	400,000	305,000	60,000	1,281,000	2,424,000
December 15	149,000	125,000	120,000	160,000	218,000	772,000	276,000	403,000	130,000	20,000	829,000	1,601,000
December 22	75,000	43,000	234,000	161,000	233,000	746,000	482,000	324,000	46,000	35,000	887,000	1,633,000
December 29	82,000	64,000	144,000	168,000	200,000	658,000	495,000	225,000	227,000	112,000	1,059,000	1,717,000
December	474,000	574,000	1,243,000	606,000	1,024,000	3,917,000	2,019,000	1,832,000	933,000	259,000	5,043,000	8,960,000

NOTE—Figures by American Petroleum Institute.

Receipts of California Oil at Atlantic Coast Ports

The following shows the receipts of California oil at Atlantic Coast ports by months with the current month given by weeks:

	Atlantic Ports						Gulf Coast Ports					
	Baltimore	Boston	New York	Philadelphia	Others	Total	Galveston	N. Orleans Baton Rge.	Port Arthur Sabine Pass	Tampa	Total	Total at all Ports
March	442,000	184,000	1,355,000	496,000	615,000	2,691,000	.....	.....	.....	.....	.....	2,691,000
April	105,000	256,000	2,456,000	502,000	320,000	3,639,000	.....	478,000	.....	.....	478,000	4,117,000
May	444,000	72,000	1,259,000	764,000	964,000	3,553,000	.....	300,000	53,000	.....	353,000	3,906,000
June	821,000	160,000	3,206,000	826,000	808,000	5,821,000	.....	664,000	.....	.....	664,000	6,485,000
July	443,000	75,000	2,068,000	741,000	699,000	4,080,000	.....	559,000	.....	.....	559,000	4,639,000
August	329,000	229,000	2,956,000	836,000	683,000	5,033,000	.....	970,000	70,000	.....	1,040,000	6,073,000
September	1,028,000	237,000	2,581,000	621,000	443,000	4,910,000	.....	703,000	.....	.....	703,000	5,613,000
October	779,000	224,000	2,503,000	779,000	429,000	4,714,000	.....	746,000	.....	.....	746,000	5,460,000
November	591,000	155,000	2,302,000	584,000	271,000	3,903,000	.....	935,000	.....	.....	935,000	4,838,000
December 1	73,000	.....	692,000	161,000	160,000	1,086,000	.....	75,000	.....	.....	75,000	1,161,000
December 8	.....	67,000	672,000	80,000	78,000	897,000	.....	245,000	.....	.....	245,000	1,142,000
December 15	381,000	72,000	751,000	402,000	.....	1,606,000	.....	240,000	.....	.....	240,000	1,846,000
December 22	.....	.....	422,000	95,000	452,000	969,000	.....	95,000	.....	.....	95,000	1,064,000
December 29	.....	76,000	364,000	75,000	63,000	578,000	.....	74,000	.....	.....	74,000	652,000
December	454,000	215,000	2,901,000	813,000	753,000	5,136,000	.....	729,000	.....	.....	729,000	5,213,000

NOTE—Figures by American Petroleum Institute.

Average Daily Production for all U. S. Fields

Kansas

	This Week	Last Week
Eldorado	17,000	17,100
Greenwood	13,100	12,200
Elbing and Peabody	10,250	10,250
Fox-Bush	6,300	6,200
Blankenship	3,600	3,625
Augusta and Douglas	3,500	3,500
Florence and Covert	3,000	3,050
Leon and Weaver	1,350	1,400
Other fields	84,100	81,000
Totals	68,050	68,305

Oklahoma

	This Week	Last Week
Burbank	69,936	72,710
Bristow	50,250	50,100
Cushing	25,100	24,950
Osage (outside Burbank)	24,000	23,900
Okmulgee	22,500	22,300
Hewitt	20,800	20,725
Wewoka	10,415	10,990
Tonkawa	42,520	44,645
Healdton	12,800	12,775
Duncan and Walters	6,900	6,900
Other fields	84,100	81,000
Totals	369,321	370,995

Louisiana

	Past Week	Previous Week
Haynesville	21,800	20,100
Caddo	10,325	10,475
Homer	8,900	9,300
Bellevue	5,675	5,750
Vinton	5,310	5,370
Bull Bayou	5,675	5,500
Elm Grove	1,035	1,050
Evangeline	635	740
Edgerly	390	350
Anse La Butte	10	10
Totals	59,755	58,845

Arkansas

Smackover	96,720	99,250
El Dorado	15,600	17,500
Stephens	3,060	3,000
Totals	115,380	119,750

California

Los Angeles, Calif., Jan. 5.—The daily average production for the past week in the California fields, compared with the previous week, with number of producers the past week in five fields, is divided about as follows:

	Last Week	Producing Wells	Previous Week
Long Beach	228,750	317	237,000
Santa Fe Springs	160,000	289	174,000
Huntington Beach	66,200	279	67,500
Torrance	34,500	95	37,250
Compton	1,300	1	1,300
Others	209,550	...	113,450
Totals	700,300	...	720,500

Mexico

The daily average production of crude oil in the Mexican fields follows:

	This Week Dec. 29	Last Week Dec. 22
Tierro B-Chap-Alamo	53,000	54,000
Cerro Azul-Toteca	39,000	42,000
Central Amatlan	21,000	20,000
Los Naranjos	9,000	10,000
Tepetate-Casiano	6,000	6,000
Potrero del Llano	6,000	5,000
San Geronimo	....	1,000
Chinconcillos	1,000	1,000
Total, light oil	135,000	138,000
Total Panuco Dist., heavy oil	288,000	295,000
Grand Mexico	423,000	433,000

DIAMOND REFINING COMPANY IN CONSOLIDATION

Kansas City, Mo., Jan. 5.—The Diamond Refining Company of Kansas City and Tulsa and the Alluwe Oil Company are to be merged. Included in the consolidation is the 2500 barrel refinery of the Kansas Oil Refining Company at Coffeyville, Kansas. The deal will give the Diamond Refining producing properties and undeveloped leases in Kansas, Oklahoma and Texas.

Texas

NORTH CENTRAL		
Corsicana-Powell	88,992	81,375
Mexia	37,000	37,000
Burkburnett	20,960	22,835
Stephens County	21,965	22,265
Electra	20,155	20,290
Archer-Holliday Counties	19,575	18,390
Desdemona-Gorman-Pioneer	7,770	7,350
Ranger-Eastland	7,075	7,060
Young County	4,490	4,160
Currie	3,940	3,990
Moran-Shackelford County	3,765	3,990
K-M-A	1,355	1,145
Strawn-Palo Pinto County	1,020	995
Mitchell County	870	855
Iowa Park	900	870
Petrolia-Clay County	395	410
Brown County	355	355
Carson County	235	240
Coleman County	145	170
Reagan County	155	150
Richland	130	125
Thrall-Williamson County	60	65
Jack County	35	30
Totals	241,342	234,115
GULF COAST		
Hull	17,500	17,600
West Columbia	14,400	14,075
Goose Creek	13,150	13,500
Orange	10,500	10,750
Humble	5,780	5,775
Sour Lake	5,100	4,700
Damon Mound	1,810	1,810
Saratoga	1,650	1,710
Batson	1,155	1,120
Spindle Top	875	855
Blue Ridge	705	745
Pierce Junction	680	685
Barbers Hill	300	320
Nacogdoches	110	110
Markham	100	100
Stratton Ridge	70	75
Dayton	60	60
Big Hill	40	..
High Island	30	40
Big Creek	..	95
Richmond	10	..
Total Gulf Coast	74,025	74,125
Total North Texas	241,342	234,115
Luling (Caldwell County)	5,700	5,000
Mirando	6,000	6,500
Somerset	3,000	3,000
Rockdale-Minerva	475	500
Total for Texas	330,542	323,240

Condensed U. S. Production for Twelve Months

(Stated in Barrels)

This table is carried each week by The OIL WEEKLY, and shows daily production average for each state or section. Figures for Oklahoma, Kansas, Texas, Louisiana, Arkansas and Mountain States are compiled by The OIL WEEKLY, while estimates for California and Eastern States are furnished by the American Petroleum Institute.

Daily average for month	*Mid-Continent	North Central Texas	Texas Coastal	†Texas Total	Kansas	Okla.	Louisiana	Eastern States	Wyoming-Montana	Calif.	Ark.	U. S. Total
August	726,981	217,208	105,966	323,148	89,998	419,775	97,936	120,750	83,938	375,000	28,834	1,618,765
September	716,107	207,467	107,790	314,932	89,760	418,880	101,857	114,200	80,490	387,000	33,135	1,540,371
October	714,906	200,465	115,130	316,370	90,404	424,037	97,502	116,375	86,412	423,750	34,127	1,489,005
November	711,521	199,223	114,150	388,376	91,098	421,200	93,410	116,375	106,092	450,000	77,225	1,668,776
December	692,702	170,187	111,819	242,010	87,508	435,007	86,513	114,900	108,679	484,000	107,732	1,722,349
January (1923)	708,372	184,885	115,628	304,790	86,720	436,767	81,205	113,500	123,254	517,500	111,920	1,770,645
February	712,007	180,364	96,984	286,493	85,298	446,345	78,068	112,500	110,328	587,500	101, 346	1,805,496
March	720,287	184,582	89,873	283,355	86,012	449,693	75,352	109,900	118,580	653,000	108,630	1,888,522
April	756,381	192,148	92,320	293,780	86,433	478,100	76,854	424,000	127,860	711,250	102,099	1,983,026
May	793,774	203,776	90,905	304,032	85,500	504,498	75,368	109,125	125,680	700,125	109,033	2,010,840
June	804,297	217,163	92,240	320,250	85,255	521,880	72,745	110,300	129,559	773,000	133,592	2,159,818
July	866,665	274,330	91,795	378,335	84,785	508,405	70,085	113,000	137,300	851,000	132,395	2,275,305
August	826,982	278,574	94,398	393,780	82,741	464,416	68,739	112,625	137,909	866,250	123,000	2,251,966
September	830,517	371,730	93,649	443,461	77,078	421 763	68,935	108,400	157,742	851 700	127,955	2,269,176
October	876,059	408,036	84,120	511,483	71,362	371,657	65,305	107,750	139,912	823,125	125,145	2,240,741
November	935,975	479,383	82,747	580,700	69,337	387,253	64,701	108,125	151,225	768,275	124,188	2,253,806
December 1	840,055	383,505	81,520	484,075	68,630	387,920	63,040	109,500	148,600	746,350	121,405	2,129,520
December 8	743,575	293,015	79,280	391,070	68,485	382,075	63,380	109,000	145,000	725,500	118,745	2,003,255
December 15	711,120	265,110	77,700	361,560	68,400	377,610	61,260	111,000	147,250	708,350	120,130	1,955,560
December 22	679,790	239,905	77,540	332,445	68,400	371,485	59,178	111,000	147,500	718,525	120,215	1,928,748
December 29	673,415	234,115	74,125	323,240	68,305	370,995	58.835	111,000	145,500	720,500	119,750	1,918,125
January 5	678,713	241,342	74,025	330,542	68,050	369,321	59,755	108,000	139,350	700,300	115,380	1,890,698

*Includes North-Central Texas, Kansas, Oklahoma.
†Beginning February, 1923, Somerset, Mirando, Rockdale and Luling production included.
NOTE—Mexia production included in North Central Texas.

(Completions for the Past Week on Page 49)

California Production Declines Continue

(Continued from page 31)

Sentinel Oil Company's test to the southeast has increased from about 1000 barrels to nearly 2000 barrels a day. But in the face of the increases at these two wells, other old wells have shown a very heavy decline. The new wells averaged about 600 barrels flush production, and some of them had very low flush production with a diminishing gas pressure.

Slow at Long Beach

Long Beach had a very slow week, only six new wells with a total flush of 6055 barrels being reported. The production decline at Long Beach was nearly 10,000 barrels.

The Long Beach decline has set in and can be expected to continue, but not so fast as was the case at Santa Fe Springs. Many of the Long Beach wells are drawing from a greater depth of sand and in most instances are not so closely drilled.

Many Santa Fe Wells Idle

There are 52 wells standing idle at Santa Fe Spring, with 72 drilling ahead, 55 of which are drilling below 4000 feet. Onlly 4 completions were reported for the week, with a total flush production of 2825 barrels. The petroleum Midway held the record for the week by completing a 2000 barrel well in this field. The other three were small.

They are working over old wells at Huntington Beach in an effort to restore production, with small success. Seven work overs the past week were placed on the pump with a production ranging from 20 to 90 barrels each. The depths of the work overs on the pump range from 4500 to 5000 feet. The four new wells had a total initial production of only 1365 barrels.

Crude Premiums

Rumors of the payment of premiums continue to circulate on the streets, but little real informaion can be secured. Reports the past week were that two of the "Big Five" were either paying a small crude premium or offering unusual inducements to owners of the wells. According to a financial statement issued by C. C. Julian, independent, he has recently purchased $214,490 worth of oil in the open market.

Starting on the first of the year, the Standard started opening shut in wells on its Temple lease at Montebello. About 40 wells had been shut in on this lease and some of the inside wells are expected to flow when opened up. Others will go no the pump.

Oil Field Safety Film Is Loaned by Union Oil

Los Angeles, Calif., Jan. 8.—A four reel moving picture depicting, through the medium of an interesting story, the safety precautions in force in the California oil fields, will be loaned free of charge to any organization or theatre wishing to show it, according to announcement by the Union Oil Company of California.

The picture, which is called "When Wages Stop" was produced in the oil fields some months ago by the major producing oil companies of California. Well known motion picture actors and actresses took part and Eddie Kull, a prominent director, had charge of the production.

The actual working conditions and safety measures of the California oil fields are brought out in the picture by an absorbing comedy-drama, filled with a strong element of romance running through it.

The picture was produced and issued with the authority of the United States Bureau of Mines at Washington. One copy of the film is now in possession of the Bureau, which has recommended it very highly and exhibited it in many eastern cities with success.

In connection with the picture and the safety precautions which it shows are being taken by oil companies, it is interesting to note that the general conception of danger of working in the oil fields is much overrated. Statistics show that, over a period of five years, with around 100,000 men employed, only 98 casualties resulted. Accident figures for several large cities show that it is four and one-half times more dangerous to walk the city streets than to work in the oil fields.

Requests for the loan of the film will be taken care of in the order of their receipt by Chester W. Brown, director of exploration and production, Union Oil Company of California, 510 Union Oil Building, Los Angeles.

H. B. Simcox has been made assistant general superintendent in the Tulsa, Oklahoma, office of The Texas Company. Before being transferred, Mr. Simcox was connected with The Texas Company's producing department at Houston.

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Discuss Future of Burbank Shut Down Plan

Probable that agreement will be modified to allow drilling in part of area involved

Tulsa, Okla., Jan. 9.—Operations in Oklahoma have not been materially handicapped by the cold weather which is gripping this part of the country. However, the thermometer has been as low as the zero mark in many parts of the state.

Tomorrow the operators in the Burbank pool will meet to determine the future of the shut down plan. There seems to be a difference in opinion as just what action will be taken by the operators. The concensus of opinion is that the complete plan will not be abrogated, but there seems to be no doubt as to the modification of it. The modification may be to allow wells to be drilled in the Burbank pool but not on the line of Kay and Osage Counties. If Kay County wells are allowed to be drilled on the line, then the Osage pool will be drained. This will undoubtedly force an Osage sale of leases, which would be unpopular with the large producers of Oklahoma at this time.

The Prairie Oil and Gas Company and the Phillips Petroleum Company have just completed three new wells in the Burbank pool. The Prairie well was brought in at the northeast corner of the southeast of the northwest of section 9-27-5, and made 730 barrels of oil from a sand topped at 2994 feet. The well is known as the Culbb No. 1. The Phillips Petroleum wells are both good producers. Their No. 7, located in the southeast corner of the northeast of the northwest of section 9-27-5 made about 200 barrels in the first 12 hours from a sand at 2980 feet. The other well, known as No. 8, made 1200 barrels of oil during the first 24 hours. This well is located in the northwest corner of the southwest of the northeast of section 9-27-5.

All of these wells were allowed an exception to the shut down plan at the meeting of the operators on December 10, 1923.

In the Otstot pool, northwest of Blackwell, the Blackwell Oil and Gas Company has completed their Humphreys No. 3 for a flow of about 100 barrels daily. This well is located in the northwest of section 10-27-1 west in Kay County. The Analou Oil Company also added a well to this district by bringing in a 14,000,000 foot gasser on their lease in the northwest of section 16-27-1 west. The well struck the gas sand at a depth of 3453 feet while the Blackwell Oil and Gas Company well got their production from a depth of 2427 feet. The Blackwell well is also making about 2,000,000 feet of gas along with the oil production.

A wildcat well owned by the Independent Oil and Gas Company has picked up a good showing of oil in the northeast of the northwest of the southwest of section 15-9-8, Seminole County. The sand was encountered at 3370 feet and the hole is now being reamed down to that depth for the purpose of setting casing to cut off a small amount of water which is showing in the well. This is the first well to have a showing in township 9-8 and much interest is manifested in its potentialities.

The twenty-fifth well for the Wewoka pool was drilled in during the week when the Independent Oil and Gas Company and the Sinclair Oil and Gas Company completed their No. 2 Foster in the northeast corner of the southwest of the northwest of section 33-8-8. The well topped the sand at 3146 feet and with the sand only scratched made about 80 barrels per hour. This is the third well spudded in the Wewoka pool.

Line to Wewoka

From the main line of the Magnolia pipe line, that company is preparing to start a line to the Wewoka pool. The intersection of the trunk line will be in Cleveland County west of McComb. The line will also pick up the production at Maude. A pump station is being erected in section 27-8-8 and will be completed in about a month.

In Hughes County the Gilcrease Oil Company well is attracting much attention. Their No. 1 Simon, located in the northeast of the northwest of section 9-9-9, which reported a sand at 1670 feet last week, came in contact

THIS WEEK IN OKLAHOMA BY TABULATION

District—	New Rigs	Locations	Completions	Producers	Gas Wells	Failures	Initial Prod.
Ardmore	13	6	10	7	..	3	1800
Bristow	21	3	6	4	1	1	225
Cushing	12	5	6	4	..	2	467
Duncan	5	2	6	..	2	4	...
Garber	..	..	..	..	..	..	...
Okmulgee	49	3	3	1	1	1	420
Osage	49	15	9	7	1	1	5050
Muskogee	7	..	3	1	1	1	10
Weleetka	12	12	1	1	..	..	275
Tonkawa	25	5	2	1	1	..	25
Totals	193	51	45	26	7	13	8267
Last week	140	38	48	22	8	17	5212

San Juan—Four State Field Rather Indefinite

Denver, Colo., Jan. 5.—A synopsis of a report made after a month of careful investigation covering 100 square miles of territory, embracing corners of New Mexico, Utah, Colorado and Arizona, commonly known as the San Juan country, is not very optimistic or encouraging. The investigator summed up his report with the sentence: "It's two years too soon."

"With not to exceed 1000 barrels of tankage, it is obviously an exaggeration to state that the shallow wells of the Midwest Company are making 3000 or even 1000 barrels each, for they have not been regularly on production. The three wells, just under 800 feet in depth, with a sand thickness of seven to 11 feet, bunched as to location, are very much alike, and are diagonally spaced with three dry holes or water wells. No. 6 well, only recently completed, makes a little water. The character of the oil, of 61 gravity and light amber in color, taken in connection with the shallow depth and sporadic outcrop, indicates a freakish condition.

"To the northeast and east of these wells within a radius of 30 miles, 23 dry holes have been drilled, some of them rather deep, one 3200 feet, with no encouraging indications. This may not be generally known. On the other hand, a 70,000,000 foot gasser about 20 miles northeast of the oil wells, and three small gas wells near Aztec, about the same distance to the east, are an evidence of at least gas.

"The prospective field is so extensive, with surface conditions so uniform, that only drilling can give any definite line, and it will take a long time to prospect so large an area. Furthermore, government regulations and Indian restrictions, interspersed with state land routine ,are not conducive to rapid prospecting and development.

Would Burden Purchasers With Collection Details

Oklahoma City, Okla., Jan. 8.—Collection of the three per cent gross production tax in Oklahoma from crude oil purchasing agencies in the state instead of from producers and royalty owners as is now done, is proposed in a bill now in the course of preparation that is to be offered to the next session of the legislature. The 1923 gross production tax produced for the state approximately $8,429,104.48.

The proposed change is designed to reduce the cost of collecting the gross production tax as it is believed it will be an easier matter for state officials to keep in touch with the six or eight major crude buyers in Oklahoma, who purchase around 80 per cent of all the oil produced. The provisions of the new bill are that these crude purchasers would be required to withhold three per cent when they settle with those from whom they buy the oil. The crude purchasers would then be required to send this three per cent to the state.

On account of the detailed work involved it is believed that the larger crude buyers, such as the Prairie, Sinclair, Magnolia, Texas Company, Gypsy, Empire and others, will offer strenuous objection to the proposed measure.

Cold Weather Holds Up Drilling Operations In Kansas; Wildcats Still Hold Interest

Wichita, Kans., Jan. 9.—Almost every oil field in Kansas is shut down on account of the intense cold. Temperature of 15 below zero is reported from the northern part of the state and not a single rig is running. Water lines, which had just been thawed out from the New Year's day cold, are frozen tight again and work in the field is impossible. In Cowley and Sumner Counties, in the southern part, operations are going forward under difficulties.

The Martin and Wilson wildcat in the Eastman district continues to flow naturally, a total of 200 barrels of oil per day. This well came in last week making about three barrels of oil per hour when the sand was topped, but after drilling a few feet deeper started off with a flow of about 15 barrels per hour. The well is located in the southwest corner of section 5-31-6. The sand was topped at 2851 feet and has been drilled two feet deeper, from which depth the production is coming.

The Valueius well in Russel County made a natural flow of 20 barrels during the week. The well had been making oil by heads with occasional flows before, but had never made as many as 20 barrels. Just as soon as the Sinclair Pipe Line Company completes its line to the well it will be drilled deeper and put on the pump. This is the well which came in 100 miles from production about a month ago and attracted the attention of scouts from all the major companies in the Mid-Continent division. The owners are very anxious to complete the well and the pipe line is being rushed to completion.

Latest reports from the Hitchcock well of the Champlin Refining Company in Sumner County say that the well will probably make about 50 barrels of oil per day when it is thoroughly cleaned and put on the pump. The well has drawn many of the scouts from the Valueius well in Russel County and leases are bringing good prices from all major companies.

"Old timers" are of the opinion that Kansas will receive more than her share of prospecting during the present year. Already many of the larger companies have been successful in blocking up considerable acreage on which will be drilled test wells. Operations should begin just as soon as the cold weather subsides and locations can be made.

The Valerius Oil Company has obtained a Kansas charter which indicates that that company expects to do some real business in this state. The charter was for a capital stock of $50,000 and their headquarters will be in Russell. The company now holds a charter under the laws of Delaware.

with a bigger pay sand five feet further down which would yield about 60 barrels daily, but drilling will be resumed as soon as it can be mudded off. The owners have decided to drill the well to the 3300 foot level, where the Papoose Oil Company well was completed some time ago. The Papoose well had a showing of oil at the same depth as the Gilcrease but sufficient production to warrant a completion was not evident. The well is located about eight miles from Wetumka.

The Gladys Bells Oil Company brought in their No. 2 well in the Tiger Flats district of Okmulgee County during the week. The well is located in the northwest corner of the northwest of the northwest of section 6-12-6 and the sand was topped at 2519 feet, from which depth the well is making about 420 barrels of oil, per day.

The Tidal-Osage Oil Company's No. 31 well in the southeast corner of the northwest of section 34-22-10, is making 2365 barrels of oil per day. The well is located in the Hominy district of Osage County and is producing from the Wilcox sand.

In Butler County the Amerada Petroleum Company has encountered a two million foot gasser in their No. 1 Butler, located in the southeast corner of the northwest of the southwest of section 34-5-1. The sand was picked up at from 1850 to 1857 feet. The nearest production to the well is about two miles to the northwest.

Wildcat Shows

Floyd O. Howarth Oil and Gas Company, drilling a wildcat in Okfuskee County in the southeast of the southwest of the northwest of section 1-11-8, has encountered a good showing of oil in their Fields No. 1, eight miles north of Okemah. The sand was topped at 3312 feet and has been drilled in 15 feet, at which depth an occasional flow by heads is evident. The well is making considerable gas and casing is being set for a test for production.

Reporting 15 feet of oil in the hole in their Hubbard No. 1, the Alcorn Oil Company is preparing to test out their well in section 12-26-2 west. The sand was picked up at 3660 feet and was drilled in about six feet.

The Gypsy Oil Company's No. 1 Cane, near Bristow, is now making about 1000 barrels of oil per day after being drilled a little deeper. The well is located in the southwest of the northwest of the northeast of section 22-16-8 and was completed about three months ago from the Dutcher sand.

In the Hewitt field the operators are going through the process of drilling old wells deeper with appreciable results. The N. L. Amster No. 2 well in the southeast of the southeast of section 16-4-2 west is now flowing 175 barrels of oil per day from a new sand at 2380 feet. The Wolverine Oil Company's Dillard No. 30, southeast of the northwest of section 22-4-2 west, is flowing about 200 barrels of oil after being drilled to a new sand at 2537 feet. The Amster well was reported as a completion more than four years ago, and was making about 40 barrels of oil per day on the pump when drilled deeper.

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32,000,000 Barrels From Powell in First Year

Woodbine has given up 105,000,000 barrels of oil in three years since Mexia discovery

Corsicana, Texas, Jan. 8.—The first anniversary of the discovery of oil in the Woodbine sand pay in the Corsicana-Powell field occurred January 7, with a total production of more than 32,000,000 barrels of crude for the first year, and all of this amount, except 470,780 barrels, was produced since July 1, 1923. The field started into the second year of its existence with a daily production estimated at 79,000 barrels, and offers only a comparatively small amount of additional drilling activity in the main producing horizon, owing to the producing structure having been practically defined on all sides.

The Woodbine sand formation furnishing production for the Corsicana-Powell, Mexia, Currie and Richland fields in East Central Texas is credited with having produced in round figures 105,000,000 barrels of crude oil up to January 1, 1924. This enormous yield of oil has been made since Humphrey's Oil Company's L. W. Rogers 1 discovered the Mexia field November 25, 1920. On January 1, 1924, the above producing areas were credited with a total of 1181 producing wells, with a combined daily production of 132,710 barrels, or an average of 112½ barrels per well. The Corsicana-Powell field on this particular date reported 595 wells making 91,822 barrels, while the Mexia field was second with a daily production of 37,137 barrels from a total of 519 wells, and the Currie-Richland area had 67 wells doing 3751 barrels. The Humphreys Oil Company leads all companies in the number of producing wells with a total of 340, while Humble Oil and Refining Company ranks second with 116 wells.

Efforts to develop the numerous shallow oil and gas producing horizons encountered in the Corsicana-Powell field when drilling for the deep pay took place during the past year are now meeting with partial success. Last week the Simms Oil Company completed its J. T. Rose 9 with an initial flow of 18,000,000 cubic feet of dry gas, with 400 pounds rock pressure, from sand pay at 1228-43 feet. This gasser is located in the southwest part of the field and is in the vicinity of a 15,000,000 cubic foot gasser completed December 7 by the Atlantic Oil Producing Company in its W. S. Kellum 10, from sand pay at 1154-61 feet. The Kellum gasser developed water trouble shortly after being completed, and declined to about 1,000,000 cubic feet daily in seven days. It is holding up around this amount, but pumping is necessary to keep the water off the sand. The production of the Simms Oil Company's gasser has been contracted for by the Lone Star Gas Company, which is building a line about three miles to the well.

The first shallow oil producer of any importance to be completed in the Corsicana-Powell field was reported last week when the Tidal Oil Company and Buttram's S. D. Ramsey 9-A swabbed 83 barrels during the first eight hour test after drilling through sand pay at 1463-90 feet to a total depth of 1610 feet. The oil rose to within 300 feet of the top of the casing in this well before it was swabbed. An offset to this well is being completed from the shallow pay by the E. L. Smith Oil Company on the Ramsey 11 acre lease.

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Aviator Pool in Webb County Extended Mile

Mirando City, Texas, Jan. 7.—The big event in the Mirando district for the week was the completion of Clark & Howard's well on the Puig ranch which added one mile of proven territory to the Aviator pool. The well is on block 68 and this throws the new territory southeast of the main pool. Casing was set at 1678 feet, the pay being topped at 1712 feet, and the depth is 1754. The well is not on pump yet so production can not be told but it is standing with 600 feet of oil in the hole.

Andrews No. 3 is to be drilled deep-

Field Extensions and Oil Demand Combine As Stimulus to North Texas Activities

Wichita Falls, Texas, Jan. 8.—Another oil producer was registered from the newly discovered 1800 foot sand pay in the south part of Wichita County, about two miles north of Holliday, during the past week when the Texarkana Oil and Refining Company's W. B. Hamilton 1 pumped 320 barrels of oil during the first 20 hour gauge from sand at 1812 feet. This well is in section 22, and a southwest offset to the 330 barrel pumper completed last month by T. O. Shappell and others on the Jackson lease at 1814-17 feet. Although the Texhoma well is reported to have drilled less than one foot in the sand pay, it is making a small quantity of water, as is the case with the Shappell well, which averaged 220 barrels of oil daily during the last 10 days in December. Considerable drilling activity is taking place in this section on the strength of the performance of the 1800 foot sand, which was first discovered last October about two miles further west when a 50 barrel pumper was brought in by Stedham & Thrasher on the Daume tract at 1824-28 feet.

Although 11 completions were reported in Archer County during the past week, the total number of operations in the county increased to 118, as compared with 111 for the week previous. Drilling activity in this county has registered a steady gain since restrictions on runs were lifted by the various pipe line companies, and trading in wildcat leases and productive properties has exceeded the combined total of all other counties comprising the North and Central West Texas district for the past two months.

Boller-Johnston and others' semi-wildcat test on the L. F. Wilson ranch, which was reported last week as proving up new territory for Archer County and extending the Wilmot-Wilson pool to the east, swabbed at the rate of 520 barrels of oil daily late last week at 1589-93 feet after cleaning out and standardizing. The well is reported to be free of any water trouble, and indicates that the trend of production of this pool is to the east and possibly to the southeast toward the Barkley & Meadows' wildcat oil producer on the Wilson ranch. The extension given the old Panther pool in Northern Archer County last week by Riner & Bailey on the L. F. Wilson ranch land, is credited with being good for 200 barrels of oil at 1616-18 feet, and was flowing 90 barrels by heads daily while rigging up standard tools to complete.

The Swastika pool in the southwestern part of Archer County, gives promise of taking in considerably more area to the southeast as result of two completions made during the past seven days. Litchfield-Coleman and others' W. S. Scruggs 1 extended the field about a mile and a quarter to the southeast last week when 55 barrels of oil were pumped during the first 11 hours from sand pay at 1337-42 feet. This well is located in the northwest corner of the east half of section 2. In the same direction from the Swastika pool, the Shamrock Oil Company's J. T. Richardson 1-B is estimated good for 150 barrels daily at 1321-26 feet. As a result of the new territory opened up by these two wells, more than half a dozen locations were made during the past week.

The first new production for Stephens County in several weeks was reported Monday when Sinclair Oil and Gas Company's Henderson 5 gauged 150 barrels daily after shot in lime pay at 3194 to 3220 feet. Three new tests are being started by Sinclair on this lease to offset producing wells. In the west edge of Stephens County and east of the Ibex field, Mahlstedt-Mook Oil Company and others are pulling casing to abandon a dry hole on the Boyett tract after drilling to 3645 feet.

Throckmorton County scored its first oil producer during the past week when Richardson and others' Reynolds Cattle Company 1 pumped 10 barrels of oil and an equal amount of water from sand at 930-942 feet.

er to try for the high gravity sand in the Aviator pool, also a development of more than usual moment. The high gravity in the Schott pool now has three wells down to the sand and they are very profitable. The Andrews corporation has had water trouble in this well and hence they will case everything off and go on down.

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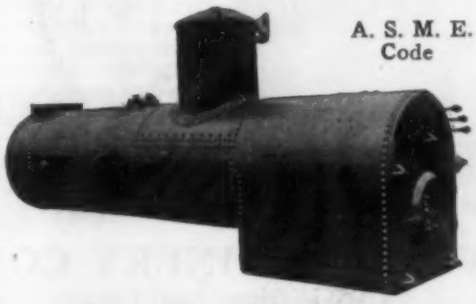

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Maggie Moore Well at Luling Flows 800 Barrels; Weather Now Permits Operation

Luling, Texas, Jan. 7.—Jarmon Oil Company's No. 2 Maggie Moore, which was making about 400 barrels by heads, has nearly doubled production on completion and is now flowing around 800 barrels a day according to advices from the field.

The No. 2 Maggie Moore is the second well on the south side of the San Marcos road and is a much better well than the No. 1 on the same lease. It went only a few feet into the pay sand and some operators believe it might have been 1500 barrels with more drilling. The company, however, took no chances and made a very good producer out of it anyhow.

The No. 1 Lopez of the United North and South is still the subject of limitless conversation. It is the first well in Guadalupe County across the river from the Luling field. Operators differ as to the significance of the well. It is said to be making about 300 barrels of fluid, some water coming in with the oil. It is three miles southeast of the Luling pool as defined by production and toward Kingsburg. This is considered likely wildcat territory and much leasing has been under way despite adverse weather. The roads have been full of lease men stuck in the mud and many thousands of acres have been blocked up. Most of the major companies are represented in this territory with large blocks.

Three new locations are announced immediately north of the Lopez well. Five or six locations are also scheduled south of Seguin in the same county, but a considerable distance from the Lopez well.

Magnolia Petroleum Company on the Imhoff tract south of Kingsburg is down 1500 feet and drilling on a promising looking wildcat. Tieman No. 1 and Baer No. 1, both wildcats near Seguin, are expected to resume drilling in a short time. They are waiting on better weather, too. Near New Berlin and Lavernia, not far from the county lines of Bexar, Wilson and Guadalupe, Dixie Oil Company plans a wildcat test to start soon in a large block of acreage which they have been leasing for the last six months.

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CORSICANA PRODUCTION

Corsicana, Texas, Jan. 9.—The daily average production of the field for the past week was divided as follows:

	Barrels
Humble Oil & Refining Company	25,750
Gulf Production Company	11,500
Humphreys Oil Company	10,000
Tidal Oil Company	6,250
Atlantic Oil Producing Company	3,825
McMann Oil Company	3,525
Skelly Oil Company	2,660
Roxana Petroleum Company	2,540
J. K. Hughes Development Company	2,540
E. L. Smith Oil Company	2,430
Elliott et al	2,340
Witherspoon Oil Company	2,235
Texas-Magnolia	1,930
Simms Oil Company	1,660
The Texas Company	1,425
Kirby Petroleum Company	1,155
Mutual Oil Company	835
Garland Kent et al	725
Sun Company	680
Barkley & Meadows	740
R. E. Brooks, Jr.	600
U. S. Tex Oil Corporation	450
T. & B. V. R. R. Co.	4[illegible]5
Cosden Oil & Gas Company	385
Galloway, Bass et al	360
Mitchell & Jones	325
New Domain Oil Company	290
Seay-Cranfill	230
Simms-Fox-Tucker	200
Sturbe & Sturbe	200
W. T. Parker et al	185
Upchurch et al	125
Collins & Wheelock	125
Empire Oil & Gas Company	110
Terrell Production Company	90
T. F. Hunter et al	75
Dick Webster et al	65
Total	88,985
Last week	81,375

Union Parish Developments Discouraging But Work Continues; Webster Looks Better

Shreveport, La., Jan. 7.—Those who have placed their bets on the Oakland area, in Union Parish, rather felt themselves slipping today upon receipt of information to the effect that Palmer & Davidson had bailed dry a second time in their No. 1 Green, in section 19-23-1 east. This well lies southwest of the Clark discovery wells, and in the direction which has received the greatest play, and the brethren are at a loss to explain the fact that the well has been bailed dry at 2262 feet and again at 2275 feet. However, things are not always as they seem, and it may be that, measurements to the contrary notwithstanding, the well is not yet deep enough. Casing was set at 2220 feet, or at 2236 feet, according to varying reports. The top of a stratum of hard sand is logged at 2266 feet.

Another failure at Oakland is recorded in the abandonment of the well drilled by Clark & Woodward, in section 17-23-2 east, which is reported as dry at 2509 feet.

Jas. A. Noe and others have begun drilling and are down below 1000 feet in their No. 1 Gulley, located in the northwest quarter of the southeast quarter of section 36-21-1 east. The Arkansas Natural Gas Company is rigging up on its Templeton lease, in section 19-23-1 east, and the Gulf Refining Company has made two new locations in the same section, one on the Green property and another on the Security Trust Company's holdings. The Roxana Petroleum Company is rigging up to drill a test on the Smith land, in section 30-22-2 west, and Cargile and others are building a derrick on the Heard location, in section 25-21-3 west.

Davidson & Palmer's Frost-Johnson producer, in section 18-23-1 east, is shut in to await the arrival of steel tanks now en route from Homer.

Cotton Valley

Supporters of the Cotton Valley area, in Webster Parish, are encouraged to the same extent as their fellows in Union Parish are discouraged, temporarily. The Louisiana Oil Refining Corporation's two 500 barrel tanks near the well drilled on the Merritt land by the Oil Fields Gas Company are now nearly full of oil, which has forced the closing in of the well for the time being. It has made better than 75 barrels of pipe line oil per day during each of the last three days, blowing through a one inch and one three-eighths inch choke.

The Fortuna Oil Company is said to be making preparations to conduct a similar test in its Merritt well in section 14-21-10, which also sprayed oil when completed, about one month earlier than the well drilled by the Oil Fields Gas Company and turned over to the Louisiana Refining Corporation.

Rumors to the effect that a blow out had occurred in O'Brien et al's (Oil Fields Gas Company) Dales well in section 26-21-9, Webster Parish, midway between Cotton Valley and the Homer field, now drilling at around 1800 feet, gained wide circulation on the streets of Shreveport yesterday, but investigation revealed that this false report had its origin in the fact that John Y. Snyder's (Cotton Valley Syndicate) gas well near Cotton Valley had cut its connections and blown wild. A telephone conversation with parties at Cotton Valley this afternoon developed that the well was then being brought under control.

The White Oil Corporation, in conjunction with J. K. Wadley, wealthy lumberman of Texarkana, who was associated with the Louisiana Oil Refining Corporation in the drilling of the Gleason discovery well, and who has always been among the most active of the prospectors in Webster Parish, is moving in a rotary rig for the purpose of drilling a location on the Gleason land, in the northeast corner of the southwest quarter of section 31-22-9, which is approximately half way between the original Gleason wells in section 13-22-10 and the Webb and Merritt wells drilled in sections 13 and 14, of township 21-10, on the Cotton Valley structure.

Of more than passing interest to those who keep close tab on the progress of the search in Webster Parish is a report to the effect that the Palmer Corporation of Shreveport is rigging up, presumably for the purpose of making a Woodbine test, in their No. 1 Miller in section 29-21-10,

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Operations on Slump in Eastern Fields; First Week of New Year Far Under Average

Pittsburgh, Pa., Jan. 5.—The first week of the year makes a very small showing in the fields east of the Mississippi river, which would seem a shut down to many, but such is not the case. The week's figures show 50 wells completed, of which 10 were dry, 17 were gas wells, with a combined volume of 39,750,000 cubic feet and 23 oil producing wells with a new flush production of 478 barrels, which is a loss from the previous week of 62 completed wells, 239 barrels new production, 19 less dry holes and 11 less gas wells, with 15,250,000 cubic feet less gas volume.

The closing month of 1923 showed a heavy decrease in all branches of the industry in the Eastern fields, fewer completions, less production, and fewer rigs and drilling wells than were reported in November. What will be done in the early spring, is most important at this time, for the talk of operators, is that they expect to see a busy year and expect to work to its full extent. They are only taking a breathing spell now.

Several advances have been recently made in the price of the various crudes in the Eastern fields, but refined products have not as yet shown much of a change. However it is evident that prices on the finished product must advance soon, not alone on gasoline but on kerosene, lubricants, fuel oil and other by products to keep pace with the advance in crude.

The week in the Pennsylvania-New York-West Virginia fields was unattractive, with the exception of two completions, one of which was a good producer and the other a deep duster. The producing well was drilled by the Hope Construction & Refining Co., on the Lynch lease to the east a couple of miles from the hamlet of West Milford, in Grant district, Harrison county. The pay was found in the 50-foot sand and the first flush amounted to 90 barrels, but is not expected to hold up at anything like that amount. This well is a mile in advance to the west of the nearest production, which is found in the Gordon sand, and opens a possible area for future development. The deep duster was drilled by the same company on the Volcanis lease, in Walker district, Wood county, and went 700 feet below the Oriskany sand to a total depth of 5,290 feet. The well failed to make as promising showing as a previous test in that immediate vicinity, which was drowned out by salt water. West Virginia has had several deep tests without results. A well was drilled on the Lake lease in Marion county to a depth of 7,570 feet. The Goff lease well in Harrison county, went to 7,386 feet and the well on the Reynolds lease, in the same county reached a depth of 6,390 feet, while one in Tyler county went down to 6,300 feet. Numerous wells have been sunk to depths from 3500 to 6000 feet in various counties of the state. The Hope Construction and Refining Company is now working on another deep test on the Gordon lease in Portland district, Preston County, near Terra Alta, and expect to make this the deepest test yet drilled in West Virginia.

Southeastern Ohio failed to register any completions during the week, and Central Ohio had but two reported that were gas wells in Richland County, near Mansfield. Northwestern Ohio's best completion was a 60-barrel pumper found by Lants, Gregg & Co., on the Schulte lease, in Lake township, Wood county, at a depth of 1290 feet. This well being located in an area of territory overlooked in the mad scramble for production years ago, may have a considerable bearing on new work to be started early in the spring to follow up the lead and connect up the famous Wood county field with that in Ottawa county.

Indiana and Illinois are practically at a standstill as far as development work is concerned, although there are a few wells drilling, but none of any great importance outside of defined limits.

The well of note in Kentucky was found in the Owensboro section southwest of Louisville, by the Leeper Oil Company on the Stewart lease, for a flush of 107 barrels of an excellent grade of crude from the Pennsylvanian formation. The Indian Pipe Line Co., a subsidiary of the Indian Refining Co., has just completed a trunk line through that part of the state running from Allen and Warren counties to Owensboro, where it connects with the same company's line that runs to the refineries at Lawrenceville, Ill. This line gives the Western Kentucky field a line direct to market. Outside of this line the Paragon Development Co., Riggs Co., and others have lines over the Western Kentucky fields, and production is being well taken care of, the only congestion being in Monroe and Cumberland counties. There the Paragon Development Co., has recently completed a 45-mile line from Neeley's Ferry to Glasgow, where the crude is loaded in tank cars and shipped direct to the big Paragon Co's plant at Toledo, Ohio. This line is taxed to its utmost on account of the accumulation of stocks while the line was being constructed, nearly 100,000 barrels having been stored in tanks on various leases awaiting completion of the line.

Mellon's New Tax Plan Inimical to Oil Industry

Tulsa, Okla., Jan. 7.—Judge Harry H. Smith, secretary of the Mid-Continent Oil and Gas Association, has received a telegram from Congressman E. B. Howard of Oklahoma, who is in Washington, to the effect that the Mellon tax plan, in its present form, is inimical to the oil industry.

Says Congressman Howard: "Draft of the Mellon bill now before ways and means committee limits the right to deplete on account of discovery to 50 per cent of the net income instead of permitting actual depletion as provided by the bill now effective. I am also informed by members of the committee that several members are anticipating an effort to entirely eliminate the right to deplete on account of discovery."

Advice as to the wishes of the association in this matter is sought by Mr. Howard.

Deep Drilling in Ontario Fields Held Up Pending Capacity Test of Discovery Well

Calgary, Alta., Jan. 7.—Deep drilling operations in southwestern Ontario, which received a considerable stimulus from the unexpected strike of oil some months ago in the Trenton limestone in Romney township, Kent County, are just now making slow progress. Operators have been holding back waiting for definite results from the Glenwood Natural Gas Company's discovery well on the Hugh Shanks farm west of Port Alma, and though this well has flowed by heads at irregular intervals, producing considerable oil, no definite capacity test has yet been made. The well has been cleaned out and swabbed, but is now reported waiting for tubing

Further east the Union Natural Gas Company's No. 248, deep test on the Truckenbrod farm, has practically finished reaming down to the Trenton limestone, before setting casing and drilling into the producing formation. Northwest of these tests, Union No. 249 Mancell farm, Tilbury East township, has set 10 inch casing at 900 feet on a new deep test. Some operators claim the Glenwood-Shanks will be a good well and open a field; others believe it is only a pocket in the bottom of the Trenton limestone, and all are waiting to see how it shows up under the strain of steady pumping.

In Lambton County the High Pressure Oil and Gas Company of Petrolia is drilling at 2300 feet on a deep test near Arkona. This test got a show of gas, apparently not in commercial quantities, in the Guelph limestone, which was not present in No. 1, a short distance from the present (No. 2) well. No. 2 will be carried to at least 3000 feet.

In Elgin County Dominion Natural Gas Company is finishing its No. 5 test for gas near Lakeview. In Essex County Bon Jasperson is starting a new test for gas near Kingsville.

Between winter weather and holidays the Canadian West has few developments to report. The most significant, perhaps, is an analysis of the crude oil from the British Petroleums, Ltd., No. 2 well on section 40-46-6w4, in the Irma-Wainwright district of East Central Alberta. The analysis, made by the technical institute at Calgary, after eliminating 15.6 per cent of water, shows the following constituents of the actual crude:

Gasoline, 6.2 per cent.

Kerosene, 21.5 per cent.

Lubricants, 66.3 per cent.

Asphaltic residue and losses, 6.0.

In Southern Alberta the Canadian Western Natural Gas Company is getting ready to link up its pipe line system with the new gas field developed last fall near Foremost. The three completed wells in this field show an estimated aggregate production of 27,000,000 cubic feet a day, and plans are being made for additional drilling the coming season, while precautions are being taken to protect the wells from water. The gas is similar to the Bow Island product, being dry and odorless; and the field gives promise of being just as prolific. It is probable that the Foremost gas has some helium content.

The company will start work early in the spring on a line of between 35 and 40 miles, linking the field with the main line near Bow Island, and it is likely a branch line will be laid to supply Foremost. The line will cost approximately $300,000.

Los Angeles, Calif., Jan. 5.—Jacques Weinberger recently resigned as vice president of Balir & Company of Los Angeles to accept the chairmanship of the executive committee of the California Petroleum Corporation. He expects to continue as a director with Blair & Company. He is also a director in the Pan-American Petroleum and Transport Corporation. He is well known in New York, South American and Los Angeles financial circles. Thomas A. O'Donnell continues as chairman of the Board, California Petroleum Corporation.

MUNCE HEADS ARKANSAS NATURAL GAS COMPANY

Pittsburgh, Pa., Jan. 8.—J. R. Munce succeeds Joseph C. Trees as president of the Arkansas Natural Gas Company, the latter having become chairman of the board. Mr. Munce will come to Pittsburgh to make his headquarters, from Shreveport, Louisiana, where he has been located. New directors of the company elected are John S. Weller, C. Anderson and J. R. Munce.

The Grain and the Chaff

IT WOULD be a task beyond the capacity of any one man in any one lifetime to consider all the devices which have at some time and in some place been offered the Oil Man as field equipment destined to revolutionize the business of digging wells.

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Completions for Past Week in U. S. Fields

Oklahoma

Company, Well, Location	Initial Production Bbls.	Depth
Carter County—		
Carter Oil Co.'s Dillard 2, SWc NE 10-4-2w	*	3890
Sure Oil Co. Walker-Vorhees 1, C SW NW SE 9-4-2w	250	2310
Merrick-Kirk Hamilton 2, C NW NE SW 5-3-2w	100	2975
Schimerhorn-Kirk Oil Co. Palmer 4, C NW SW SW 32-2-2w	200	2895
Healdton Pet. Co. Burrows 3, SW NE NE 31-2-2w	100	2500
Hivick et al Dickinson 1, C N L NE SW 19-2-2w	*	2645
Wirt Franklin's Galiger 2, C SE SW NE 25-2-3w	500	2474
Southwestern Pet. Co. Bristow 5, C NW SE SE 25-2-3w	300	2785
Magnolia Pet. Co. Lohman 2, SEc 23-2-3w	350	2375
Cotton County—		
Amerada Pet. Co. Powell 1, NWc SW NE 29-4-10w	*	3593
Creek County—		
Wilcox & Witten's Wrightsman 2, C S L SE SE NW 11-17-10	¶	1605
Tibbens et al White 4, SEc 12-14-8	85	2373
Midwest & Gulf Chatfield 3, C N L NW NE 20-15-10	*	3220
Nowata O. & G. Co. Tuscker 3, NWc NE NW 21-16-9	80	2989
Hiram O. & G. Co. Williams 1, NEc SE 21-16-8	25	3180
Transcontinental Mitchell 1, SEc NE SW 22-17-8	35	3097
Grady County—		
Magnolia Pet. Co. Sanford 4, C NW NE SW 35-5-8w	¶	1480
Grant County—		
Marland Oil Co. Zich 1, SWc NE 7-28-3w	*	3816
Kay County—		
Spencer et al Klink 1, SEc NW NW NW 21-29-1	¶	2017
Sam Sitrin's 21-A, SW NE SW SW 27-25-9	25	2124
Love County—		
Reid-Davenport Gray 1, NEc 9-7-1w	*	3062
Muskogee County—		
Wooster Oil Co. H. Corbray 16, SW SE 35-14-14	10	1223
L. J. Hutchinson L. E. Colbert 1, SEc NW 16-14-14	*	1745
Western Nat. Gas Co. Scott 1, S W L SW SE 29-11-17	¶	2327
Noble County—		
Cosden & Marland School 7, C NE SE SE 16-24-1w	40	1998
Healdton O. & G. Co. Rence 12, C SE NW NE 11-24-1w	300	2626
Rence 11-A SWc NW SW NW 11-24-1w	60	2590
Comar Oil Co. Rusek 7-A, C NW NE SE 3-24-1w	67	2232
Okmulgee County		
Gladys Belle Oil Co. Mitchell 2, SWc NW NW 6-12-12	420	2542
North Baltimore Oil Co. Sugar 5, NWc NE 13-12-11	*	2701
Osage County—		
I. T. I. O. 319, SE NE 34-29-11	¶	928
Okla P. & R. Co. 1, NE SE SW 10-27-10	25	1998
Owen Osage 264, NE SE NW 9-28-12	*	1670
Peters Markham 11, SW NE SW 4-23-9	60	2136
Tidal Osage 31, C S L N½ S½ NW 34-22-10	2365	2292
Riverland Oil Co. 1, SWc 1-22-10	700	2260
Barnsdall Oil Co. 16, SW NW SW SW 29-21-12	250	1967
21, SE NE NW 9-20-12	150	1710
Peer Oil Co. 2, NE NE NW 28-20-12	1500	2053
Payne County—		
Cosden O. & G. Co Yount 7, NEc 31-18-5	*	850
Skelly Oil Co. Brown 7, SWc NW NW 32-18-5	*	3275
Seminole County—		
Dixie Oil Co. Foster 4, SWc NE NE 32-8-8	275	3145
Stephens County—		
Gant & Tee Pec Oil Co. McDonald 2, NEc SE NE SE 13-2-8w	¶	1398
Walker Valley Oil Co. Glen 1, NEc SW 5-1-8w	*	2418
Roxana Pet. Co. Cook 3 "N," NEc SW 30-1-8w	*	2340
C. & O. Drilling Co. Dow 6, SE SE NW NW 30-1-8w	*	2085
Tulsa County—		
H. & S. Oil Co. Doyle 1, SEc SW 4-17-14	¶	1458

Kansas

Company, Well, Location	Initial Production Bbls.	Depth
Cowley County—		
Wilson & Martin Eastman 1, SWc 5-31-6	200	2858
Elk County—		
Halstead et al Osborne 1, NWc 8-31-11	*	2888
Greenwood County—		
D. A. Weiss Mathews 2, SW NE NW 31-22-10	40	2583
Rogers et al Barnard 2, C W L NW NE 31-22-10	35	2577
Mission Oil Co. Tucker 2, NWc SW 22-23-10	*	2300
Parkins & McKinnas Gaffner 1, SW NE 18-24-11	*	2636

Texas

DESDEMONA-GORMAN

Knox-Lewis Oil Co. Eidson 2	75	2880
Magnolia Pet. Co. L. G. Ross 4	30	2849

EASTLAND-RANGER

George Ablon Collins 1	*	3505
Ochiltree et al Webb 1	5	1314
The Texas Co. L. A. Hightower 3	45	1220

STEPHENS COUNTY

Mahlstedt-Mook Oil Co. et al Boyett 1	*	3645
Sinclair Oil & Gas Co. Henderson 5	150	3220

CORSICANA-POWELL

Magnolia Pet. Co. & The Texas Co. I. T. Kent 16	150	2900
Simms Oil Co. J. T. Rose 9	¶18	1243
Tidal Oil Co. & Buttram S. D. Ramsey 9-A	200	1610

BURKBURNETT

J. J. Perkins et al Saunders Est 3	*	1975
Bradley Oil Co. J. Hirschi 19	225	1895
Magnolia Pet. Co. Hortain-Walker 21	50	1151

ELECTRA

Rowe Drill'g Co. W. T. Waggoner 1	50	1860
Houston Oil Co. W. T. Waggoner 14	35	1654
Texhoma Oil & Ref. Co. S. B. Burnett 1-C	50	1355
Magnolia Pet. Co. McDonald-Burnett 1-DD	5	2116

K-M-A DISTRICT

Carter-Inland Oil Co. K. & Kempner 1	90	1798

IOWA PARK

Panhandle Ref. Co. W. H. Chilson 1	15	1820
Texhoma Oil & Ref. Co. W. B. Hamilton 1	350	1812

ARCHER COUNTY

Boller et al L. F. Wilson 1	500	1593
Bridwell & Heydrick L. F. Wilson-Kohler 1	*	1655
Camp Oil & Gas Co. et al L. F. Wilson 4-H	110	1606
L. F. Wilson 3-H	250	1600
Riner & Bailey's L. F. Wilson 1, block 29	200	1617
L. F. Wilson 1-A	25	1620
Shamrock Oil Co. J. T. Richardson 1-B	150	1326
Sun Oil Co. W. R. Farmer 3	20	1495
Swastika Oil Co. A. P. Neal 1	*	2975
Green et al Coleman 1	*	1590
R. M. F. Oil Co. L. F. Wilson 5-B	100	1603

LULING

Caldwell County—		
Jarmon Oil Co. Maggie Moore 2	500	....
United North & South Oil Co. Lopez 1	200	....

MIRANDO

Chandler & Gear's Wolcott Ochoa Pasture 1	100	....

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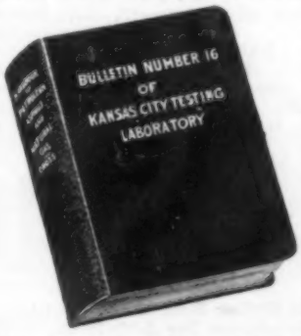
Books On Petroleum

The knowledge gained through years of work and study by some of the most capable men in the oil industry is set down in the books listed herein. Order some of these books and profit by the experience of others.

(The following is reprinted from our complete catalog of OIL BOOKS, which will be sent free on request. Watch this space from week to week for description of practically every book available on Petroleum.)

Handbook of Petroleum, Asphalt and Natural Gas

By Roy Cross, Member A. C. S., A. S. T. M., A. A. A. Sc., A. S. M. I. Published as Bulletin No. 16 of Kansas City Testing Laboratory.



General Outline of Contents: Economics of Petroleum.—Uses, statistics, geographical distribution, geology, production, prices, depletion of wells, drilling methods. Transportation, Storage and gauging.—Pipe lines, storage losses, tank specifications, fire regulations, tank cars, loading, storage tanks, gauging, measurements. Properties of Crude Petroleum. — General and chemical constitution, distillation properties, physical properties. Special commercial petroleums. Refining of Petroleum, Including Cracking. — Refining practice. Refinery designs. Cost of refining. Chemical nature of cracking. Properties of gasoline and naphtha made by various processes of decomposition. Aluminum chloride process. Classification of cracking processes. Benton process. Dewar & Redwood process. Burton process. Cross process. Cracking and refinery engineering. Calculation of cracking yields and refinery profits. Properties of Refined Petroleum. — Gasoline. Benzol. Kerosene. Gas Oil. Distillate Oil. Straw Oil. Lubricating Oil. Grease. Paraffin wax. Transformer oils. Petroleum. Miscellaneous refined oils. Complete detailed specifications. State laws. Fuel Oil—Chemical and physical properties. Advantages over other fuels. Comparison with other fuels. Sampling. Relative costs. Specifications. Combustion. Oil Shale, Shale Oil and Coal Naphtha.—Occurrence, properties, distillation products, by-product coal distillation plants, gas manufacturing. Asphalt.—Refining oil for road building and paving purposes. Properties of asphaltic and bituminous materials. Various types of asphaltic pavements with their properties and specifications. Specifications for brick filler. Asphalt for water-proofing. Road oils. Natural Gas.—Occurrence of natural gas. Production. Prices. Composition. Manufacture. Gasoline by absorption method. Capacity of absorption towers. Manufacture of carbon black. Properties and production of Helium. Explosions of natural gas. Measuring the capacity of gas wells. Capacities of gas pipe lines. Methods of Analysis of Petroleum, Asphalt and Natural Gas.—Standardized and commercial methods. Tables.—Gravity correction tables, temperature correction tables. Mensuration conversion tables. Bibliography.—Publications and Patents. 625 pages 5½x8 in black flexible cover, round corners, loose leaf binding.

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Cosden Official Heads New Venezuelan Project

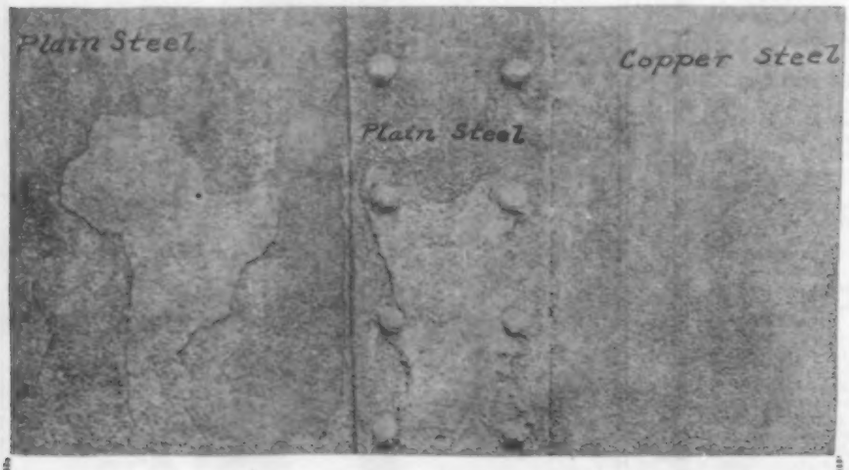
Tulsa, Okla., Jan. 5.—H. N. Gries of of Tulsa, a director of Cosden & Company and widely known in American oil and sporting circles, heads the new Lago Petroleum Company which has been organized for development of oil concessions in the Lake Maracaibo area in Venezuela, South America. J. S. Cosden, president of Cosden & Company, and Harry Payne Whitney, both of New York, also are backing the enterprise.

The Lago company controls a total of approximately 2,290,000 acres which covers the entire bed of Lake Maracaibo except strips along edges of the lake at certain points. This holding had been quietly acquired over a period of time prior to the formation of the company. The group also holds concessions in the Venezuelan state of Monagas.

Companies operating in Venezuela include Standard Oil Company (New Jersey), Union Oil Company of California, Pure Oil Company, Texas Company, Gulf Oil, Atlantic Refining, Sun, Royal Dutch-Shell, Anglo-Persian, and others.

C. H. COLE DIES

Kansas City, Mo., Jan. 5.—C. H. Cole, president and for more than 20 years identified with the United Iron Works, Inc., with general offices here, died at his home in Kansas City. He was 65 years old and was prominently known in Mid-Continent and eastern oil circles.



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MALONEY TANKS

Mexia, Texas, Jan. 7.—The Humphreys Pure Oil Company is running an 8-inch line from its Colonel station on the north end of its Mexia-Coast line to the Atlantic Oil Producing Company's tank farm on the Griffith lease, a distance of about 12 miles to empty the tanks of their crude contents.

California

Company, Well, Location	Initial Production Bbls.	Depth
TORRANCE		
Petroleum Midway Bowers 1	75	3650
Stockton Com. 1	560	3677
DeWitt 1	500	3750
Universal Consolidated Moore 6	800	3775
Checot Trust Phenis 1	500	3756
McGregor Synd.'s 1	75	3886
2	250	3798
Big Star 3	750	3767
C. C. M. Oil Co. Kettler 1	1500	3810
Torrance 22	400	3775
Torrance 25	1000	3700
LONG BEACH		
Petroleum Midway Foster 1-2	1525	5007
Shell Hamilton 2	375	4149
Shell Stake Miller 3	3150	5050
Lou Anger Oil Synd.'s Schiller 2	700	4505
Henderson Pet. Synd.'s 1	130	5002
General Pet. Bixby 1 (wo)	175	4431
SANTA FE SPRINGS		
Shell Co. G. H. N. 11	150	4612
Shell Co. Slusher 11	75	4628
Wilshire Oil Co. Meyers 2	600	4657
Petroleum Midway Mattern 2-1	2000	4677
HUNTINGTON BEACH		
Globe Oil Co.'s 4	150	4150
Union Oil Co. Copeland 13	325	4848
Federal Consolidated Fidelity 1	690	3500
Shell Co. Ashton 8	200	4650

Louisiana

Bellevue Shallow Field, Bossier Parish—		
Bliss & Weatherbee Fee A-10, 15-19-11	25	414
Standard Oil Co. Bliss & Weatherbee 9 10-19-11	10	382
Total, 2 wells	35	
Caddo Parish—		
Dixie Oil Co. Robertshaw 57, 14-21-15	10	1714
Fortuna Oil Co.'s Robertshaw 18, 23-21-15	7	1669
Total, 2 wells	17	
Elm Grove Field, Bossier Parish—		
Palmer & Davidson Childress 1, 18-16-11	¶5	838
Monroe Field, Ouachita Parish—		
The Texas Co.'s Gibbs 3, 20-19-5e.	¶15	2245
Sarepta Gas Field—		
Oil Fields Gas Co.'s Bolinger 1, Bossier Parish	¶40	2654
Ohio Oil Co. Martin 1, 34-23-10	¶37	2652
Total, 2 wells	¶77	

Arkansas

Stephens Field, Columbia County—		
Atlantic Oil Prod. Co. Milner 4, 24-15-20	25	2109
Magnolia Pet. Co.'s Hammond 3, 25-15-20	35	2112
Total, 2 wells	60	
El Dorado East Field, Union County—		
Donoway Oil Co.'s Tufft 1, 7-17-14	*	2134
Smackover Field, Ouachita County—		
Jimmie Cox Burton 1, 30-15-17	*	2050
Burton 2, 30-15-17	*	1960
El Dorado Union Oil Co. Smith 2, 36-15-17	120	2280
Gulf Ref. Co. Hampton-Meeks 1, 19-15-16	155	2320
Johnson et al's McElroy 1, 29-15-16	140	2285
Keen & Woolf's Myar 3, 32-15-16	155	2250
Klotz & Thomas Pearce 1, 26-15-17	50	2332
Magnolia Pet. Co.'s Patton 3, 32-15-16	100	2250

Company, Well, Location—	Initial Production Barrels	Depth
Marr Drilling Co.'s Berg 1, 31-13-16	*	1983
Roxana Pet. Corp.'s Laney 1, 31-15-15	¶28	2284
Simms Oil Co.'s Hildebrandt 6, 28-15-15	65	2034
Standard Oil Co. Hardy 9, 4-16-15	105	1997
Solmson 3, 29-15-16	300	2277
Vitex Oil Co. Hill 1	*	1825
Smackover Field, Union County—		
Crawford & Sebastian James 5, 6-16-15	¶30	2270
Federal Pet Co. Murphy 2, 22-16-15	125	2029
Gulf Ref. Co. Clawson 1, 14-16-15	200	1996
Murphy 3, 17-16-15,	140	2039
Hodges et al's Murphy 1, 7-16-15	200	2101
Invader Oil Co. Hill 1, 5-16-15	*	2009
Kemp et al's Garza 1, 6-19-15	*	2456
Rico Oil Co.'s Burton 1, 30-16-15	*	2124
Walton et al's Hicks 1, 11-16-16	*	1880
Total, 23 wells	¶58	1855

Eastern States

PENNSYLVANIA

Company, Well, Location—	Initial Production Barrels	Depth
Greene County—		
Judson Bell & Co. M. Moran 1	¶3	....
Freeland & Co. Yeager 1	¶2½	....
Carnegie Nat. Gas Co. Mrs. John Anderson 1	¶3	....
Manufacturers Light & Heat Co. J. & N. Elbin 1	¶3	....
Peerless Oil & Gas Co. Whitehill 2	¶2	....
J. L. Garard Garard 40	¶2½	....

WEST VIRGINIA

Company, Well, Location—	Initial Production Barrels	Depth
Kanawha County—		
United F. G. Co. Koontz-Osborne 12	¶1	....
Koontz-Osborne 13	¶1	....
Koontz-Osborne 14	¶1	....
Taylor 1	¶1½	....
Martin 1	¶1	....
Wetzel County—		
Hope Construction & Ref. Co. Dan Kuehn 1	¶4	....
Wiser Oil Co. J. McIntyre 2	5	....
Harrison County—		
Hope Construction & Ref. Co. Mary D. Lynch 1	90	....
Wirt County—		
Roberts Bros. Hopkins 1	5	....
Roane County—		
Taylor & Barnes L. F. Smith 2	¶3½	....
Marshall County—		
Clue Bros. & Co. J. W. Mason Hrs 1	¶4	....
Doddridge County—		
Trainer & Summers Paul Allen 2	¶2	....
Wood County—		
Hope Construction & Ref. Co. Volcanic tract 1	*	5290

KENTUCKY

Company, Well, Location—	Initial Production Barrels	Depth
Russell County—		
Carnahan Oil Co. W. C. Dalton 1	10	278
W. C. Dalton 2	10	276
Coffee 15	15	....
Weller & Co. E. Mann 1	*	398
Owensboro District—		
Leeper Oil Co. Stewart 7	107	480
McCoombs Oil & Refg. Co. At Narrows 1	*	770
Wood Oil Co. Howard 1	*	740
Powell County—		
Powell Oil Co. Samuel Hall 8	15	....
Thirteen Oil Co. Virdin 4	5	....
Hupp, Duff & Co. C. Mullins 4	10	....
Cumberland County—		
W. S. Raydure Mrs. Coop 1	7	560
Bentley & Co. Crabtree 1	*	550
Louisville Gas & Elect. Co. W. W. Wright 1	*	950
Allen County—		
McAlpin Oil Co. Cherry 6	*	275
W. R. Thompson Weigle 1	*	....
W. M. Leonard J. W. Stark 23-acres 6	2	290
Owsley County—		
Coombs Bros. Drilling Co. Fred Evans 2	40	....
Johnson & Co. S. Flannery 1	15	....
Lee County—		
J. H. Sallee Lucy Watkins 8	10	....
The Petroleum Co. J. T. Hare 4	10	....
Warren County—		
Gillespie Oil Co. Gillespie 4	15	1134
Johnson-Magoffin Counties—		
Atlantic Oil Prod. Co. H. Cantrell 20-a. 3	5	....
Wayne County—		
J. H. Johnson & Co. Tom Simpson 1	3	....

Company, Well, Location—	Initial Production Bbls.	Depth
Adair County—		
Bartow-Florida Interests Smith 1	*	203

CENTRAL OHIO

Company, Well, Location—	Initial Production Bbls.	Depth
Richland County—		
Weideman & Co. D. Malone 1	¶4	1070
Bricker Bros. & Co. Noble 1	¶1¼	....

NORTHWESTERN OHIO

Company, Well, Location—	Initial Production Bbls.	Depth
Wood County—		
Lantz, Gregg & Co. F. Schulte 4	60	1290
Davis & Carroll Wm. Grolle 1	20	1250
Allen Oil Co. Roe Hrs. 3	20	1328
Ottawa County—		
John Weber W. Sandrock 7	6	1367

INDIANA

Company, Well, Location—	Initial Production Bbls.	Depth
Pike County—		
Nelson Bros. Walt Lindsay 1	*	1180

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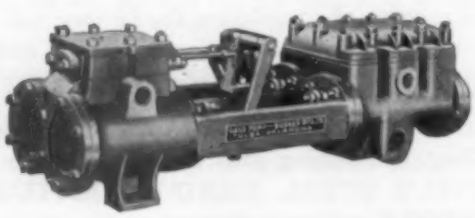

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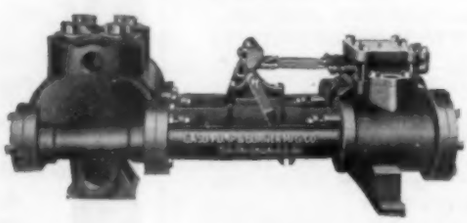

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TEXAS

Archer County—Oil Investment Co.'s Mrs. N. J. Parish 4-B, SP Ry sur, 150 ft to S and E lines. C. H. Verchoyle L. F. Wilson 1, Amer Trib sur, 150 ft to S and E lines. Ray, Massie & Featherston's L. F. Wilson 1, Amer Trib sur, blk 27, 150 ft to S and W lines. Sixty-Six Oil Co.'s L. F. Wilson 7, SP Ry sur, sec 4, 300 ft N No. 3. Texas Co.'s W. P. Parrish 1, SP Ry sur, sec 2, 150 ft to N and W lines. E. W. Brown's Fee 2, S. M. Luce sur, 120 ft to W and 50 ft to S line. W. C. Parker et al's J. T. Jackson 6, D. C. S. L. blk 5, 150 ft S No. 2. Kentucky Oil Corp.'s L. F. Wilson 1, Amer Trib sur, 410 ft W No. 2. G. C. Shoemacker's L. F. Wilson 1, SP Ry sur, blk 27, 150 ft to N and W lines. Murchison & Fain's L. A. Hightower 4, sec 1, Wm. Van Norman sur; L. F. Wilson 1, Amer Trib sur, 150 ft to S and W lines. Roberts & Hill et al's L. F. Wilson 2, Amer Trib sur, 300 ft W No. 1. Simms Oil Co.'s M. A. Dowlen 1, H& TC Ry sur No. 2, 1985 ft to W and 1490 ft to S line. Frank A. Darr's W. P. Ferguson 1, SP Ry sur, 150 ft to N and E lines. Humble Oil & Ref. Co.'s A. P. Nichols 1, Amer Trib sur, 150 ft to N and E lines. Texhoma Oil & Ref. Co.'s J. D. Lyles 1, Hopper & Wade sur, 150 ft to N and W lines. Wildee Oil Co.'s L. F. Wilson 3, Amer Trib sur, 150 ft to W and 496 ft to S line. R. P. Dorian's L. F. Wilson 2, Amer Trib sur, 150 ft to S and E lines. T. J. Pyle's J. H. White 1, Amer Trib sur, 150 ft to N and E lines.

Atascosa County—Witherspoon Oil Corp.'s R. A. Langley 2, J. Sharp sur, 200 ft to N and E lines.

Bexar County—Helvetia Oil Co.'s E. Smith 6, abst 294½, 550 ft E No. 3. Grayburg Oil Co.'s A. F. Ernst 27, sec 5 W. C. Brown sur, 150 ft to S and W lines. Helvetia Oil Co.'s E. Smith 9, abst 294½, 250 ft to N and E lines.

Callahan County—Dennis & Andrews' Mrs. R. D. Williams 8, TE&L Ry sur No. 2973, 300 ft S No. 5. Big 5 Oil Co.'s Shackelford 1, TE&L Ry sur No. 2270, 150 ft to S and E lines. Chappell & Hadcock's J. B. Eubank 7, TE&L Ry sur No. 2271, 450 ft to S and 150 ft to E line. Godley Oil & Gas Co.'s J. H. Ogle 3, TE&L Ry sur No. 2297, 300 ft E No. 2; J. H. Ogle 6, 300 ft NE No. 1. Louis Mollingkopp's Wilson 1, TE&L Ry sur No. 2271, 450 ft to N and 200 ft to E line. W. R. Cox's M. Hught 1, D&D Asy sur, blk 6, 150 ft to N and E lines. Shackelford Oil Co.'s Fee 7, TE&L Ry sur No. 2270, 150 ft S No. 2. W. R. Andrews et al's L. Williams 2, TE&L Ry sur No. 2973, 300 ft E No. 3, Univ Lands sur, sec 133, SE No. 3.

Caldwell County—M. K. Towns Prod. Co.'s J. Merriweather 4, Jno. Henry sur, 150 ft to S and E lines; 5, 300 ft N No. 4.

Eastland County—Panhandle Ref. Co.'s L. A. Hightower 9, Wm. Van Norman sur, 593 ft W No. 2. Humble Oil & Ref. Co.'s W. T. Merrill 5, Wm. Van Norman sur, sec 11, 155 ft to S and E lines; W. T. Merrill 1, blk 12, 250 ft to E and 1265 ft to S line. Kokomo Pet Co.'s J. G. Harris 2, M. A. Hamilton sur, 330 ft to S and E lines. Magnolia Pet. Co.'s W. G. Westmoreland 15, T. Tyler sur, 300 ft E No. 14. Texas Co.'s L. A. Hightower 4, sec 1, Wm Van Norman sur.

Falls County—E. H. R. Sabens' L. B. Whitt 1, A. Montgomery sur, 475 ft to N and 175 ft to W line. E. Falvey's A. Chance 1, L. A. Manchaca sur, 150 ft to N and E lines.

Fort Bend County—Gulf Prod. Co.'s T. W. Davis 10, M. Young sur, SW No. 7.

Hardin County—S. R. Buchanan's Fee 71, J. Milhomb sur, W No. 69.

Jefferson County—Hooke & McLean's W. G. Lovell 1, Wm. Cann sur, 1029 ft to river and 1392 ft to W line.

Kleburg County—Humble Oil & Ref. Co.'s KT&I Co. 2-A, KT&I Co. sur, blk 7, 150 ft to S and W lines.

Liberty County—Gulf Prod. Co.'s Phoenix Dev. Co.'s 36, J. De Vore sur, 200 ft S No. 35.

Live Oak County—Wm. Olschewske's J. M. Brown 1, Jno. Turner sur, 1000 ft to N and 225 ft to W line.

Milam County—Texas Pet. Dev. Co.'s C. F. Neihaus 7, C. F. Neihaus sur, W No. 6; Phillips 2, Phillips Farm sur, N No. 1.

Navarro County—J. K. Hughes Dev. Co.'s M. M. Alexander 7, J. Smith sur, 300 ft NW No. 3. Seay, Cranfield & Reynolds' B. W. Harvard Est 3, J. D. Matthews sur, 300 ft W No. 2. W. T. Parker's I. N. Cerf, 3-A, J. Smith sur, center. Simms Oil Co.'s J. F. Allen 1, J. Smith sur, 150 ft to S and E lines. Buttram-Tidal Oil Co.'s S. D. Ramsey 9-A, J. Smith sur, 191 ft N No. 3-A. Simms Oil Co.'s J. T. Rose 10, Harris & Green sur, 150 ft to E and 1564 ft to S line.

Shackelford County—Humble Oil & Ref. Co.'s Wm. Poindexter A-5, Blind Asy sur, 150 ft to W and 1500 ft to S line. Dennis & Drake's Dennis Hrs 4, Ins Asy sur, 150 ft to N and 750 ft to E line. Simms Oil Co.'s R. A. Elliott 1, Bayland Asy sur, 150 ft to N and W lines. A. G. Ilseng's Mrs. W. E. Gill 1, Univ Lands, sur sec 69, 150 ft to E and 825 ft to N line. L. D. Head et al's J. S. Dennis 1, 2 and 3, Insane Asy sur. A. J. Hughes' Wm. Poindexter 1, Insane Asy sur, 1500 ft to W and 150 ft to S line.

Stephens County—Texas Co.'s L. Heathley 6, T&P Ry sur, 390 ft to E and 1957 ft to N line; J. W. Parks A-38, TE&L Ry sur, 1000 ft to S and E lines.

Val Verde County—Hodges & Wright's B. S. Harrison 1, I&GN Ry sur, blk 83, SE cor.

Wichita County—Texhoma Oil & Ref. Co.'s W. T. Waggoner 15-E, sec 33, H&TC Ry sur; S. B. Burnett et al 4, SA&MG Ry sur No. 271, 550 ft to W and 1081 ft to N line. Shappell Oil Co.'s J. L. Jackson 3, D. C. S L., blk 23, 631 ft E No. 1; 2, 300 ft S No. 1. Gulf Prod. Co.'s J. F. Miller 1, W. R. Eaves sur, North Central; E. A. Dale 16, TE&L Ry sur, 300 ft S No. 14. Cox, Mitchell & Boyd's J. F. Mitchell Est 1, P. Castleman sur, 150 ft to E and 1708 ft to S line; 2, 300 ft E No. 1. Sonner Oil Assn.'s T. W. Roberts 10, H&GN Ry sur, 300 ft N No. 8. Knight & Hines' B. T. Dulton 1, D. C. S. L., 150 ft to N and E lines. Eureka Drilling Co.'s T. F. Mitchell Est 1, P. Castleman sur, 213 ft to E and 150 ft to S line. A. D. Robinson's J. E. Roller Est 6, W. A. Grady sur, 150 ft to N and W lines. Wylie & McNees' Waggoner Bros. 1, M. A. Willis sur, 160 ft to S and W lines. Greben & Stacey's T. L. Burnett et al 1, SA&MG Ry sur, 150 ft to S and E lines. Panhandle Oil & Ref. Co.'s J. L. Jackson 1, D. C. S. L., blk 23, 150 ft to N and W lines. Harry Jaffe's Waggoner Bros. 1, M. A. Willis sur, 150 ft to S and W lines. E. P. Bowen's A. F. Fassett 1, E. T. Ry sur, sec 2, 150 ft to S and W lines. Jackson Farm Oil Co.'s J. L. Jackson 1, D. C. S. L., blk 20, 150 ft to S and W lines. Texas Co.'s W. T. Waggoner 386, H& TC Ry sur, blk 5, 400 ft NW No. 260. Culbertson Co.'s Waggoner Bros. 21, BS&F Ry sur, blk 13, 900 ft to N and 1215 ft to E line.

Webb County—Chas. G. Chandler's Ochoa 2, Ochoa Pasture sur, 150 ft to N and W lines. R. F. Duggan's J. M. Garcia 2, abst 1100, Black Panther Pet. Co.'s F. Garcia 5, abst 601, blk 1, 1050 ft to W and 150 ft to N line. Nueva Oil Co.'s E. Garcia 2-G, sec 592, blk 50, 500 ft S No. 1.

Wheeler County—W. D. Sheddon's 1, H.&GN Ry sur, NE cor.

Wilbarger County—J. S. Dennis' W. C. Beckett 1, Waggoner Colony sur, 450 ft to N and 900 ft to W line.

Young County—M. J. Bashara's Fee 1, TE&L Ry sur, 450 ft to N and 150 ft to E line. Pomona Valley Oil Synd.'s J. Hughes 1, J. Abernathy sur, NE cor.

LOUISIANA

Bossier Parish—R. J. Barry, Tr.'s Elston 13, 10-19N-11W, 985 ft W and 306 ft N of SE cor of sec; Elston 14, 10-19N-11W, 870 ft W and 518 ft N of SE cor of sec. Louisiana Oil Ref. Corp.'s Fee D-11, 15-19N-11W, 799 ft E and 450 ft S of NW cor SE¼.

Calcasieu Parish—Edgerly Pet. Co.'s Vincent 2, 34-10S-12W, 149 ft S and 42 ft E of NW cor lot 112.

Evangeline Parish—H. M. Journee's LeDonvis Land Co. 1 35-3S-1W, 500 ft N and 500 ft E of center of sec.

Ouachita Parish—Consumers Gas Co., Monroe, La., Richie 3, 32-19N-5E, 283 ft W and 250 ft S of NE cor of sec.

Union Parish—Arkansas Natl. Gas Co.'s Templeton 1, 19-23N-1E, 200 ft S and 200 ft E of NW cor NE¼ of SE¼.

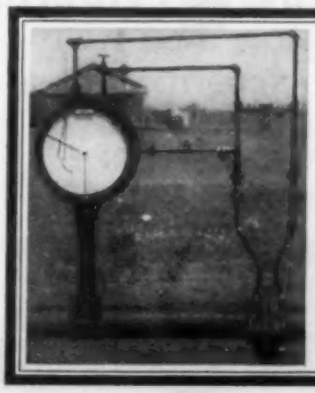
ARKANSAS

Grant County—The Texas Co.'s Chicago Land & Timber Co. 1, 14-5-13, 1980 ft S and 710 ft E of NWc of sec.

La Fayette County—Wilburn et al's Hughes 1, 21-19-23.

Ouachita County—El Dorado Union Oil Co.'s Hughes 2, 28-15-16, 165 ft S and W of NEc of NW¼ NE¼, deepening old well. Gulf Ref. Co.'s Harris 1, 30-15-16, 330 ft N and 990 ft W of SEc NE¼; Solmson 1, 29-15-16, 330 ft N and E of SWc SE¼ SW¼. Howell et al's Elliott 1, 24-15-17, 200 ft N and W of SEc NW¼ NW¼. Lanier et al's Shirley 3, 30-15-16, NWc S½ NW¼ SE¼. Mangus et al's Fee 1, 24-15-17, 200 ft S and 550 ft E of NWc NW¼ SE¼. Smith Ref. Co.'s Patton 6, 31-15-16, SWc NW¼ NW¼. Staples et al's Smith 2, 36-15-17, 200 ft N and W of SEc SE¼ NE¼.

Union County—Humphries Oil Co.'s Hicks 1, 20-16-15, 200 ft S and W of NEc NE¼ SW¼. Smackover Pet. Co.'s Murphy 3, 14-16-15, 200 ft N and W of SEc NW¼ SW¼. Weissman Oil Co.'s Harrell 2, 17-16-15, 495 ft N and 660 ft E of SWc NE¼ NW¼.



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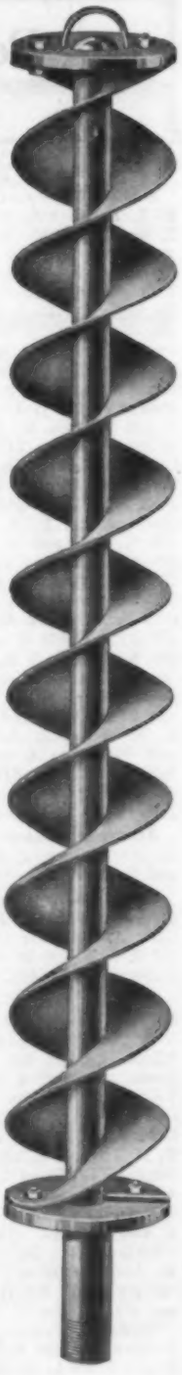
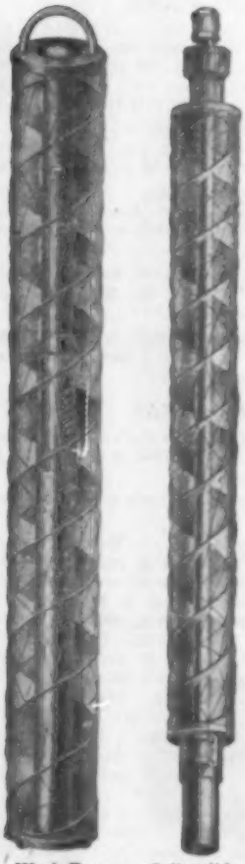
THE BEST BOTTOM WATER PLUG IN EXISTENCE



To set the GUIBERSON Plug, the core stem is driven downward through center of spirals, causing the spirals to collapse like contracting springs.

Like contracting springs also, the diameter of the spirals increases as they collapse. Their outer edges bite into the walls of the well.



Wash-Down Type — Collapsible Core Type

A grip like that of a screw is thus secured.

The oakum packed between the spirals is compressed into a gas-tight mass.

This plug gives several exclusive advantages. It (1) takes a meshed, or biting, grip, (2) expands uniformly throughout its length, instead of bulging at one point, (3) compresses the packing uniformly.

It is today recognized as the one and only SCIENTIFIC bottom water plug.

Made in three styles, the STANDARD, shown at right; the WASH-DOWN, shown at extreme left, which permits flushing of the hole before setting; and the COLLAPSIBLE CORE, which can be set at the extreme bottom of the well.

Fully patented. See your supply house.

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GUIBERSON

BETTER BE SAFE THAN SORRY

Say you saw it in The Oil Weekly

WILDCATS FROM ALL SECTIONS

Expect Completion of Second Reagan County Well in Ten Days; Several Locations Made

Fort Worth, Texas, Jan. 7.—A completion is expected within the next 10 days from one of the two tests drilling in the vicinity of the wildcat producer, which discovered a high gravity oil field in Reagan County section of West Texas last May with initial flow of 80 barrels daily by heads from top of sand at 3026 feet. These two drilling tests are in the same section with the discovery well, and were acquired last October from the Texon Oil and Land Company by the Big Lake Oil Company, along with the discovery well and leases on 16 sections of adjoining land. The acreage involved in the deal is owned by the University of Texas. The test known as University No. 2 is located 800 feet due west of the oil producer, while University No. 3 is located 800 feet due north of University No. 2, and northwest of the discovery well.

The Big Lake Oil Company's University No. 3 is expected to be the first to reach the producing horizon, and flow tanks were being erected early this week to handle the oil if a producer is obtained. This test was scheduled for completion during the first week in January but the string of six and five-eighths inch casing at 2820 feet froze when an attempt was made to pull and under ream preparatory to lowering to 2935 feet to cut off water and cavings. A string of five and three-sixteenths inch casing was then ordered from Ranger, and plans are to start lowering this casing about January 8. Allowing two days for this work, the officials of the Big Lake Oil Company have hopes of drilling to the pay sand, a distance of less than 100 feet, before the close of the present week. It is planned to drill in this test without delay, and determine as far as possible what production the sand pay offers in a west direction from the discovery well. The Big Lake Oil Company's University 2, which has been delayed in completion for nearly two months, owing to parted casing and junk in the hole at 2770 feet, is reported to have successfully drilled by these obstructions in the hole, and should be an early completion also. The Big Lake Oil Company has rigs up for two other tests, and materials are en route from Pittsburgh for steel derricks to be used in drilling its other two locations previously announced.

Although more than seven months have elapsed since the Reagan County wildcat blew in as an oil producer, it continues to pump on an average ranging from 150 to 170 barrels of 38 gravity paraffin base oil daily, and will flow by heads if allowed to stand idle for a period. The production from this well is being sold as fuel to other wildcat tests in this general section of West Texas, while some of the oil is being purchased and shipped out in tank cars by independent refiners.

The Transcontinental Oil Company, which operates a refinery and lube plant at Fort Worth, is reported to be making preparations to build a loading rack on the Orient railroad near the discovery well, and D. H. McCracken, vice president, is expected in Reagan County later this week to decide on the location of the rack. Both the Big Lake Oil Company and the Transcontinental Oil Company are subsidiaries of the Benedum-Trees interests of Pittsburgh, and it is understood that the Transcontinental Oil Company will market the production of the Big Lake Oil Company, besides any production that it might obtain from the 50,000 acres in leases held in Reagan, Crockett and Pecos Counties. An announcement was made some weeks previously that the Mid-Kansas Oil and Gas Company had made contract to drill three free wells for a half interest in this acreage held by Transcontinental, and exact locations will probably be announced this month.

Materials are being moved in for a location announced this week by the Benedum-Trees interest on University land in the northwest corner of section 2, block 6, Reagan County. This test will be about seven miles to the southwest of the discovery well, and will probably be drilled by the Arkansas Natural Gas Company, or Plymouth Company, both subsidiaries of the Benedum-Trees interests. The drilling of this test will hold 16 sections of leases in accordance with lease contract made for University of Texas acreage.

Kansas Wildcats

BARBER COUNTY—B. B. Brown's 1, NWc SW NW 33-30-14, sd 3000 ft.

BARTON COUNTY—Cheyenne Oil & Gas Co.'s Sooy 1, SWc SW 27-18-12, fsh 2525 ft. McMinn et al's Baker 1, SWc 5-8-13, sd 760 ft. Haynes et al's 1, SWc SW 31-18-12, rig. H. W. Neiswanger's Everleigh 1, SW SE 1-18-12, lcn; Weiker 1, NWc SE NW 2-19-12, dr 500 ft. Mountain States Oil & Gas Co.'s 1, SEc NE 22-18-13, dr 2400 ft. McMahan & Samptec 1, NWc 19-19-12, rig.

FINNEY COUNTY—Garden City O. & G. Co.'s Wann 1, SEc SE 36-21-30, sd 2890 ft.

GEARY COUNTY—Liberty Texas Oil Co.'s Wright 1, NEc NE 9-12-6, sd 750 ft; Foster 1, NEc SW 30-16-6, sd 2000 ft.

JEFFERSON COUNTY—Northern Counties' Edwards 1, SEc NW NW 13-9-19, fsh 3400 ft.

KINGMAN COUNTY—Hale et al's Garner 1, SWc NW 34-27-1, sd 2543 ft.

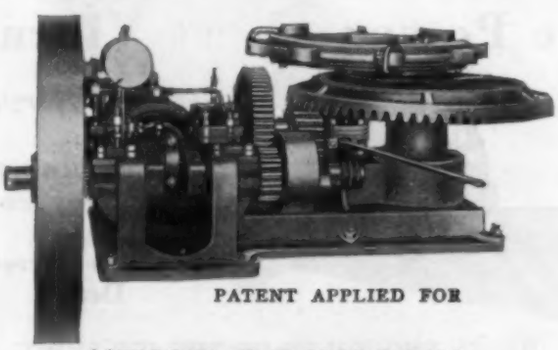
OSBORN COUNTY—McKnight et al's Worley 1, NWc NW 34-10-15, rig.

OSAGE COUNTY—Sharpless & Starke's Kirklen 1, SEc NW 36-17-14, lcn. Rodgers & Bittler's Berthe 1, SEc NW 28-17-15, lcn. Mul Vit Dev. Co.'s Neil 1, NEc NW SW NE 8-17-17, sd 2735 ft. Rogers & Brown's 1, NEc SW 15-16-16, sd 1500 ft. Foster Oil Co.'s 1, NEc SW 8-16-17, sd 1470 ft.

POTTAWATOMIE COUNTY—Crawford et al's Stewart 1, C E L SE SE SE 17-9-12, rig; Greischabert 1, SWc SE SW SW 31-9-12, rig; St. Mary's 1, SWc 11-10-12, sd 2290 ft.

RENO COUNTY—Haynes et al's O'Halloran 1, NWc SE NW 28-25-6, sd 2610 ft. Travis et al's 1, NE SW 5-26-4w, dr 1200 ft.

RILEY COUNTY—Ritchie et al's Boyle 1,



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PARKERSBURG, W. Va.

SEc 36-7-4, sd 2601 ft. Walton Oil Co.'s Thierer 1, NWc 20-10-2, dr 1550 ft. Pawnee O. & G. Co.'s Marks 1, SWc NE NW 26-10-6, sd 1700 ft.

REPUBLIC COUNTY—Mitchell O. & G. Co.'s Walker 1, SEc NE NE 23-2-1, dr 2025 ft.

SEWARD COUNTY—C. T. Development Co.'s Wood 1, NWc SE 34-34-34, sd 700 ft. Seward O. & G. Co.'s Seeley 1, NEc NW 20-33-33, co 2427 ft, show oil.

SUMNER COUNTY—S. H. E. Dev. Co.'s Stout 1, SEc NE 13-31-2, sd 3050 ft. Jack Robinson et al's Barker 1, NWc 2-31-1, lcn; Brady Bros.' Turpin 1, SWc 13-32-2, sd 3360 ft. Collins & Frantz's Young 1, SEc NE 33-33-2, lost hole, skidding rig. Collins, Claude & Nelson's Dillion 1, NEc 34-34-1, rig.

TREGO COUNTY—Morton et al's Kyser 1, C E½ 9-11-22, r 1406 ft. Keyes Pet. Co.'s Walsh 1, NWc SE 5-11-25, sd 1700 ft; Walsh 2, SWc NE SW 5-11-25, sd 1550 ft.

WASHINGTON COUNTY—Barnes O. & G. Co.'s Wickham 1, SEc SW 9-5-5, sd 1305 ft.

Oklahoma Wildcats

ATOKA COUNTY—McPhearson et al's Wild 1, SWc NW 7-2-9, sd 2850 ft. Hanson et al's Dabney 1, C SE NW 17-4-11, sd 100 ft. J. F. Torrence et al's Fee 1, SWc NE NE 1-2-9, sd 1350 ft. Waupenucka Dev. Co.'s Underwood 1, C W L SE SE 28-2-9, sd 1700 ft.

BECKHAM COUNTY—Bollion Oil Co.'s Green 1, C SW SW 34-10-24 sd 1360 ft. Ship-Nash et al's 1, SEc NW 35-9-25, fsh 2400 ft. J. A. Pringle's Burkholder 1, C NE NE 6-9-24, sd 3110 ft. Magnolia Pet. Co.'s Ezzell 1, NEc 36-9-24, dr 3808 ft. Turman Oil Co.'s 1, SWc NE 4-8-22, sd 2757 ft.

BLAINE COUNTY—Okomo Oil Co.'s Edlemaier 1, 21-15-10, dr 625 ft. Thompson et al's Dickerman 1, C SE SE SE 26-15-12w, sd 3213 ft.

CLEVELAND COUNTY—Gart Oil Co.'s Holland 1, NEc SE 31-10-4, r 2570 ft.

CUSTER COUNTY—Hoover Oil Co.'s 1, NWc SE 34-13-14, sd 2510 ft.

COAL COUNTY—Basie Oil Co.'s Heck 1, SEc 18-2-9, rig. Bearman et al's Payte 1, SWc NW NE 32-2-9, sd 2780 ft. Guy Vaughn's Downard 1, NWc SW 16-2-10, hfw 1600 ft co; Nichols 1, SW 1-1-11, rig. McPhearson et al's Jamison 1, NWc NE NE SW 24-1-8, sd 300 ft

GRANT COUNTY—Ossenbeck et al's Hoffman 1, SEc 23-29-3, dr 2285 ft. Marland Oil Co.'s Zich 1, SWc 7-28-3, dr 3700 ft. Embry et al's Edwards 1, C SE SE NW 20-26-4, fsh 900 ft. Alcorn Oil Co.'s Hubbard 1, C S L NW 12-26-2, dr 3398 ft. Day Oil Co.'s Van datta 1, SWc NW 8-26-2w, sd 1270 ft.

GREER COUNTY—Western Natl. Gas Co.'s De Armond 1, NWc SW 23-7-23, sd 2015 ft.

HARMON COUNTY—Keyes Oil Co.'s 1, NWc SW 21-2-26, set 8-in 1963 ft.

HUGHES COUNTY—Flesher Pet. Co.'s Smith 1, NWc NE NW 8-9-12, r 3250 ft. W. J. Thurber's Foster 1, SEc SW SE 5-7-8, dr 900 ft. Kingwood Pet. Co.'s Burnett 1, NWc NE SW 7-7-10, dr 5209 ft. Paraffin Oil Co.'s Love 1, NEc SE NE 13-7-12, dr 2960 ft. Middle States Oil Co.'s 1, NWc 13-6-11, dr 3530 ft.

JACKSON COUNTY—Douglas Oil Co.'s Jackson 1, NWc SW SE 20-3-20, dr 3345 ft. J. D. Wade 1, C SW NW 36-2-23, dr 1660 ft.

JEFFERSON COUNTY — Magnolia Pet. Co.'s Peck 1, C NW SW NW 4-3-6, dr2420 ft. Humble Oil & Ref. Co.'s Lewis 1, NEc NE SE 16-6-7, dr 2290 ft. Gant et al's Skelton 1, C NE NE NW 22-3n-6w, dr 1150 ft. Hutton Bros.' Karlatobe 1, NEc NE SW 5-5-7w, dr 2503 ft.

KAY COUNTY—Comar & Gypsy Oil Co.'s Garrett 1, C NE NW SE 31-27-2, co 2240 ft. Ostot Dev. Co.'s Rohos 2, C NW NW SE 3-27-1, dr 1716 ft. U. S. Smelter Co.'s 1, NWc NE SW 15-27-1, co 3474 ft, show good oil. Blackwell Oil & Gas Co.'s Kumber 1, C NE SE 9-27-1, fsh 2375 ft; Humphreys 2, C NW NW SW 10-27-1, dr 1690 ft. Alcorn Oil Co.'s Mills 1, C NW SE 24-26-1, dr 1995 ft. Amerada Pet. Co.'s Elledge 1, NEc SE 32-27-1, r 2605 ft. Guyles & Daniels Chism 1, SEc NW 23-29-2, sd 2060 ft. Spencer et al's Klink 1, SEc NW NW NW 21-29-1, dr 1870 ft. Brown & Wood's Lowery 1, NEc SW 11-26-1, sd 1245 ft. Mid-States Pet. Co.'s Cardin 1, SWc SE 8-28-2, dr 2900 ft, hfw.

KIOWA COUNTY—Connor et al's 2, NEc NW NW 34-7-16, r 1350 ft. Kiowa Dev. Co.'s School 2, NWc NE 33-6-20, sd 960 ft.

LINCOLN COUNTY—Heinze et al's Horton 1, SWc NE 7-14-4, dr 3260 ft. Sun Ray Oil Co.'s Gallagher 1, C N L SE SE 18-13-5, sd 2310 ft to standardize.

LOGAN COUNTY—Buford-Brim Oil Co.'s Newman 1, NWc NE 32-19-3, collapsed cas 2480 ft.

LOVE COUNTY—Wickenheiser et al's Real 1, NEc SE NW 13-5-3, sd 2465 ft. Reid-Davenport Oil Co.'s Gray 1, NEc 9-7-1, sd 3002 ft. Drillers Synd. Oil Co.'s 1, NWc NE 11-7-2, sd 2830 ft.

MARSHALL COUNTY—Humble Oil & Ref. Co.'s Scott 1, SEc NE SW 22-6-4, sd 2986 ft. Magnolia Pet. Co.'s Everett 1, C NE NE SE 36-7-5, dr 2380 ft.

McCLAIN COUNTY—Day Oil Co.'s Ball 1, SEc NW NE NE 9-5-3, dr 1250 ft.

OKLAHOMA COUNTY — W. R. Ramsey Hendricks 1, SEc 8-21-1, co 3655 ft. Firestone Oil Co.'s School 1, NWc SE 36-11-3, dr 3470 ft. Big Three Oil Co.'s Wild 1, SWc NE 3-12-12, rig down 1390 ft.

PITTSBURGH COUNTY—Paraffin Oil Co.'s Pratt 1, NWc SE NE 13-7-12, set 10-in 1976 ft.

PONTOTOC COUNTY—Harper et al's Dener 1, NWc SE SE 19-5-7, dr 175 ft. Smith et al's Norris 1, SWc SE 34-4-6, dr 2365 ft.

POTTAWATOMIE COUNTY — Ossie Oil Co.'s Howell 1, SWc NE 13-10-2, r 2460 ft. Magnolia Pet. Co.'s Bredinberg 1, C SE SW NW 18-7-5, dr 2710 ft. Dave Detrick's McGahey 1, SEc 10-6-2, dr 2860 ft. H. G. Guinnup et al's Floyd 1, SWc SE 13-11-3, dr 1850 ft. No. Am. Oil Co.'s Madgett 1, NWc 25-10-4, rig.

ROGER MILLS COUNTY — Kellogg Oil Co.'s Dr. Seba 1, C E L NE NE 10-16-21, dr 2565 ft. Twin Hills Oil Co.'s McClure 1, NW 15-15-26w, dr 1500 ft.

SEMINOLE COUNTY—H. Taylor Johns 1, SEc NE 34-9-6, sd 2368 ft. Independent Oil Co.'s Ahaisse 1, NEc SW 15-9-8, dr 3365 ft. W. E. Phillips et al's Davis 1, SEc NE NE 28-9-8, fsh 3078 ft. Ossenbeck et al's Davis 1, C SW NE. 10-8-7, fsh 3335 ft. Wm. McDougall's Belle Dindy 1, SW SW 20-6-7, r 1645 ft. Maxwell et al's Charty 1, C NE NW 36-6-6, rig. Link Oil Co.'s Carolina 1, C SE NW 14-6-7, co 1875 ft.

TILLMAN COUNTY—Luffborough et al's Finley 1, SWc NE SW NW 23-2-7, sd 2955 ft. Marshall Bros.' Riverbed 1, SWc NE NE 8-5-14w, cementing 1520 ft.

WASHITA COUNTY—R. B. Hartman's 1, NEc SW SE 23-9-7, sd 3030 ft. Santrock Bros.' 1, SWc NE 20-8-16, sd 2510 ft. McCoy et al's Praetters 1, C SW SW NE 9-8-15w, sd 50 ft.

Arkansas Wildcats

COMPLETIONS

Company, Well Location—	Initial Production Barrels	Depth
Dallas County—		
Hall et al's Taylor 1, 5-10-16.....	*	2043
Union County—		
Federal Pet. Co. Union Saw Mill Co. 2, 26-17-12	*	3218
Isola Oil Trust Mathews 1, 34-16-14	*	2259

DRILLING REPORT

CALHOUN COUNTY—Harris & Bickley's Freeman-Smith 1, 26-16-13, sd 1152 ft.

CLARK COUNTY—American Drilling Co.'s Wilson 1, 15-8-22, sd 440 ft.

CLEVELAND COUNTY—Clark & Melat's Wilson 1, 12-8-12, dk. Rex O. & G. Co.'s Ward 1, 18-11-11, sd 610 ft. Southern Arkansas Oil Co.'s Moore 1, 27-9-10, to re-set 8-in 1725 ft.

COLUMBIA COUNTY—Brown et al's Robinson 1, 23-18-23, sd 2844 ft. De Soto & Hickman's Fullenwilder 1, 3-16-21, set 6-in 2166 ft. Dowdy et al's Fullenwilder 1, 12-17-22, set 6-in 2070 ft; td 2166 ft. Hosey et al's Haire 1, 30-19-18, sd 2156 ft. Miller et al's Watts 1, 20-16-18, sd 1990 ft.

DALLAS COUNTY—Conway et al's Riggs-Matlock 1, 33-8-15, sd 1805 ft.

DREW COUNTY—Graves et al's Karnes 4, 10-13-6, set 8-in 1748 ft. Rhodes et al's Martin 1, 27-12-8, dr 1145 ft.

GRANT COUNTY—Grant County O. & G. Co.'s Cargile 1, 26-5-12, sd 1740 ft. The Texas Co.'s Chicago Land & Timber Co. 1, 14-5-13, dr 50 ft.

HEMPSTEAD COUNTY — Hope Columbus Oil Co.'s King 2, 24-11-25, to test at 2107 ft. Martin et al's Adams 1, 36-12-27, fsh 2165 ft. Meyer et al's Nicholls 1, 17-11-25, sd 1765 ft. Orr et al's Yates 1, 19-12-23, sd 1610 ft.

LA FAYETTE COUNTY — Ken-Saw Pet. Co.'s Red River 1, 34-19-24, sd 2823 ft. Lewisville Synd.'s Osborne 1, 16-15-24, dr 2050 ft. Wilburn et al's Hughes 1, 21-19-23, dr 300 ft.

LITTLE RIVER COUNTY—Gaines et al's Thomas 1, 15-13-29, sd 1890 ft. Johnson et al's

More Power—Less Vibration

Instant Service

Insist on Lightning Pumping Powers

They Are Correct in Design

HUSKY ENOUGH TO DO THE JOB RIGHT

The reliable eccentric motion does away with jerky lines. Built in 3 sizes.
No. 1— 6 to 8 H. P. engine, weight 3200 lb.
No. 2—12 H. P. engine, weight 4600 lb.
No. 3—Belt drive, weight 6500 lb.

Turntable gear is easily removable and having a broad face, coarse teeth and large diameter will stand up to the heaviest loads.

SHACKLE LINES SET LOW TO THE GROUND (13 IN.) ELIMINATE EXCESSIVE STRAIN. QUICKLY INSTALLED.

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Kansas City, Mo.

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PATENT
Lead Cone and Canvas Ratchet
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continuous
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service

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Left hand buttress threads, shallow cut, do not weaken pipe—prevents packer from uncollapsing.

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The canvas consists of strong and durable duck, compressed to iron-like hardness, insuring a nearly perfect pack.

—3—
The lead insures a good joint on the pipe and increases packing capacity—lessens danger of bursting pipe.

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HOUSTON, TEXAS FACTORIES MEMPHIS, TENNESSEE

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Equipped With Seamless Steel Couplings

6-⅝" and smaller

Prompt Delivery

Better than ordinary casing for shallow wells; an absolute necessity for deeper holes.

Standard Seamless Tube Co.

Pittsburgh, Pa.

Hawkins 1, 10-11-31, sd 960 ft. Red River Valley Oil Co.'s Taylor 1, 29-13-29, sd 2790 ft.

MILLER COUNTY — Cochran & Ray's Adams 1, 4-14-27, sd 2850 ft. Kingsley et al's Thompson 1, 33-14-28, sd 500 ft.

NEVADA COUNTY—Arkrado Oil Co.'s McCain 1, 36-10-23, rig. Anderson & Edward's Eaves 1, 11-12-23, sd 180 ft. Carter et al's Bailey 1, 31-13-21, sd 400 ft. Miller-Burnham-Hawley Synd.'s Perry 1, 12-15-22, sd 545 ft. Prescott Oil Co.'s Henry 1, 10-12-20, sd 2406 ft. Steele & Sandlin's Martin 1, 13-14-22, sd 2420 ft. Transcontinental Oil Co.'s Blakeley 1, 14-13-20, dr 2590 ft. Wooten et al's Moore-Martin 1, 9-13-20, sd 1225 ft.

OUACHITA COUNTY — Eck & Boger's Criner 1, 21-15-19, dk. Foster et al's Harvey 1, 32-11-19, dk. Hopkins et al's Allen-Curry 1, 33-14-19, sd 2050 ft. Leeper et al's Wesson 1, 23-15-19, set 2½-in tubing on packer; well flowed about 3 barrels; now wosr. Peltier et al's Eagle 1, 25-12-16, sd 2000 ft. Pure Oil Co.'s Moline 1, 21-11-17, fsh 2415 ft. Riley et al's Henry 1, 10-11-16, sd 2072 ft. Smackover Creek Oil Co.'s Moon 1, 32-15-17, set 6-in and sd 1861 ft.

UNION COUNTY—Bondurant et al's Clark 1, 34-17-12, to set 4½-in 2655 ft; Turbeville 1, 9-18-12, sd 1610 ft. Garrett et al's Robinson 1, 33-18-14, sd 2464 ft. Harrell Trust's Steele 1, 11-19-12, sd for cas 2435 ft. Quaker City Pet. Co.'s Salome 1, 14-17-15, dr 2125 ft. Ray et al's Long 1, 28-16-14, sd 1960 ft. Starke et al's Little 1, 21-19-12, sd 2220 ft.

Louisiana Wildcats

COMPLETION

Company, Well, Location	Initial Production Bbls.	Depth
Bienville Parish—		
Hodge-Hunt Lumber Co. Fee 3 31-15-5	*	277

DRILLING REPORT

BIENVILLE PARISH—Ohio Oil Co.'s Bodcau 1, 19-16-6, dr 2420 ft. Smith et al's Durrett 1, 34-18-5, dk. Smith et al's Harrell 1, 6-18-5, dk.

BOSSIER PARISH—Atlantic Oil Producing Co.'s Bolinger 1, 38-23-11, lcn. Skannal et al's Fee 1, 22-17-12, sw 2590 ft; plugged back to 2450 ft. Sneed et al's Jones 1, 23-18-11, sd 400 ft. Tarver Pet. Co.'s Bolinger 1, 15-22-14, sd 2657 ft. Zink & Kurbert's McGuffin 1, 4-18-11, sd 260 ft.

CADDO PARISH—Brewer et al's Sharp 1, 15-18-16, r 2445 ft. Caddo-Western Gas Co.'s Gardner-Blades 1, 2-16-15, sd 2050 ft. Crude Oil Co.'s Alexander-Ledbetter 1, 27-16-14, sd 1510 ft. Humble O. & R. Co.'s Youree-Randolph 1, 24-20-15, fsh 2892 ft. Louisiana Pet. Co.'s Brewer 1, 33-23-16, dr 2000 ft. Matson et al's Nickerson 1, 30-19-15, dk. Myra et al's Roberts 1, 34-23-15, sd 2810 ft.

CALDWELL PARISH—Culver et al's Culver 1, 21-14-4e, rig.

CLAIBORNE PARISH — Triangle Drilling Co.'s Ranich 1, 17-22-5, sd 2650 ft.

DE SOTO PARISH—Caldwell et al's Welch 1, 7-14-10, dr 1765 ft. Terrell et al's Porter 1, 22-12-13, rig; Porter 2, 15-12-13, dk tmbrs. Ulrey et al's Frost-Johnson 1, 3-11-15, to set 8-in 1500 ft; to 1800 ft.

LA SALLE PARISH — Helm & Burch's Urania 1, 21-11-3e, dk. Urania Pet. Co.'s Urania 2, 20-10-2e, sd 2120 ft; Urania 3, lcn.

LINCOLN PARISH—Bickner et al's Colvin 1, 35-20-2w, dk. Four Creeks Oil Co.'s Colvin 1, 35-20-3w, sd 950 ft. Middlefork Synd.'s Kay 1, 8-20-3w, casing stuck; td 2356 ft.

RED RIVER PARISH—Coushatta Synd.'s Marsten 1, 24-12-10, sd 2250 ft.

UNION PARISH—Arkansas Nat. Gas Co.'s Templeton 1, 19-23-1e, rig. Cargile et al's Heard 1, 25-21-3w, dk tmbrs. Clark & Woodward's Clark 1, 17-23-2e, set 6-in 2174 ft. Davidson & Palmer's Green 1, 19-23-1e, set 6-in 2220 ft; drilled plug and bailed casing dry; drilling in to test. Empire Gas & Fuel Co.'s Hamilton 1, 30-19-1e, dr 3310 ft. Evans et al's Cole 1, 16-22-2e, lcn. Lide et al's Templeton 1, 18-23-1e, lcn. Neddo Petroleum Investment Corp.'s Smith 1, 2-23-3w, rig. Noe et al's Gulley 1, 36-21-1e, dr 100 ft. Ohio Oil Co.'s Dubach Lumber Co. 1, 15-20-1w, rig. Roxana Pet. Co.'s Smith 1, 30-22-2w, rig. Tarver et al's Rhodes

A Guaranteed Product

Steelex balls and seats and **Bronzex** balls and seats are ground to fit—guaranteed tight.

Each ball and seat is ground together individually and they are kept in sets through the different operations in manufacture.

You can always depend on **Steelex** (In the red box) and **Bronzex** (in the yellow box). They are always absolutely uniform in quality and accurately machined.

You must appreciate how much this means toward reducing your operating costs.

If you forget the name Remember the Package

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Franklin, Penna.

PUMPING EQUIPMENT

Team Work

B. C. Forbes says, "Civilization is built on team-work," and so is BANKING.

When the Oil Man helps the Bank, he enables the Bank to help him.

This Bank performs many services for its clients which we'd like to have you inquire about.

A Bank of Personal Service

Commercial National Bank
Shreveport, La.

1, 30-21-1w, dk. Union Parish Drilling Synd.'s Fee 3, 17-23-1e, sd 2287 ft.

WEBSTER PARISH—Cotton Valley Synd.'s Merritt 1 and 2, 14-21-10, lcns. Fortuna Oil Co.'s Pruitt 1, 17-21-9, rig; Stratton 1, 31-22-10, rig. O'Brien et al's Dales 1, 26-21-9, dr 1510 ft. Oil Fields Gas Co.'s Hope A-1, 13-21-10, set 6-in 2393 ft; Hope B-1, B-2, and B-3, lcns. Palmer & Blount's Anders 4, 6-18-10, sd 825 ft. Palmer Corp.'s Miller 1, 29-21-10, to resume dr 3378 ft. Snyder et al's Hodges 2, 15-21-10, dk. Standard Oil Co.'s Woodward & Walker 1, 16-17-8, dr 925 ft. White Oil Corp. and J. K. Wadley's Gleason 1, 31-22-9, lcn.

North Texas Wildcats

(Note—This report does not include tests that have been shut down indefinitely.)

BAYLOR COUNTY—Wurtz et al's Porter Ranch 1, sd 1010 ft.

CLAY COUNTY—Crude Oil Prod. Co.'s Kinder 1, dr 1115 ft. J. T. Cumley et al's J. D. Stine 1, dk. E. C. D'Yarmett's Carpenter 1, sd 2000 ft. Gulf Prod. Co.'s H. Boddy 1, fsh 2800 ft; C. M. Worsham 3, dr 900 ft. Lone Star Gas Co.'s N. H. Martin 1, dr 700 ft; Withers 2, dr 300 ft. Nebraska Oil & Gas Co.'s W. H. Myers 1, dr 3310 ft. Nix-Moore Oil Co.'s F. M. Hull 1, sd 1500 ft. Seaboard Oil & Gas Co.'s L. Zihlman 1, dk.

COOKE COUNTY—Big Indian Oil Co.'s B. W. Davis 1, sd 2790 ft. Red River Drilling Co.'s Whaley Jones 1, sd 1300 ft.

DENTON COUNTY—Hill Crest Oil & Dev. Co.'s J. H. Rayzor 1, sd 1350 ft.

GRAYSON COUNTY—Zee Tex Oil & Dev. Co.'s G. W. Cannon 2, sd 2960 ft; Griffin 1, sd 2225 ft.

HARDEMAN COUNTY—Frizell Oil Co.'s M. S. Winbury 1, sd 3075 ft.

KING COUNTY—Banks Oil Co.'s J. R. Hailey 1, sd 1630 ft.

KNOX COUNTY—Brazos Bend Oil Co.'s J. E. Clark 1, dr 1875 ft. White Oil Corp.'s Ward Ranch 1, sd 2810 ft.

MONTAGUE COUNTY—Bowie Chief Oil Co.'s C. H. Boedeker 1, sd 2725 ft. Gulf Prod. Co.'s T. Benton 1, dr 3110 ft. Humphreys Oil Co.'s J. W. Maddox 3, sd 1950 ft. Mascho Oil Co.'s J. L. Howard 1, dr 2200 ft. Rycade Oil Co.'s R. D. Beasley 1, fsh 3030 ft. Spencer & D'Yarmett's Wilson 1, sd 1080 ft. Texon Oil Co.'s L. Crenshaw 1-A, sd 2300 ft; L. Crenshaw 1-B, sd 1225 ft. The Texas Co.'s C. W. Rucktashel 1, dr 275 ft.

Texas Panhandle Wildcats

(Note—The drilling report below does not show wells that are shut down indefinitely.)

ARMSTRONG COUNTY—Magnolia Pet. Co.'s Adair Est 1, sd 3950 ft.

CARSON COUNTY—Culbertson Bros.' V. B. Armstrong 1, sd 175 ft. Gulf Prod. Co.'s S. B. Burnett 3, sd 3150 ft. Humphreys Oil Co.'s J. M. Sandford 1, sd 2535 ft. W. W. Silk et al's S. B. Burnett 3, dr 2100 ft. The Texas Co.'s Mary C. Burnett 1, sd 40 ft; S. B. Burnett 3, dr 1725 ft. Tipton, Stone et al's McConnell 1, sd 3028 ft.

GRAY COUNTY—W. H. Holmes et al's J. S. Morse 1, sd 915 ft. The Texas Co.'s G. H. Saunders 1, testing cas, td 2375 ft.

HEMPHILL COUNTY—Piney Oil Co.'s Hopkins 1, dr 3050 ft.

HUTCHINSON COUNTY—Coline Oil Co.'s M. Sandford 1, sd 3220 ft. Humphreys Oil Co.'s Johnson Bros. 1, fsh 2600 ft. Montgomery Oil Co.'s Johnson Bros. 1, dr 1800 ft. Plains Oil Co.'s I. F. Weatherly 1, sd 3260 ft. Producers & Refiners Co.'s L. Bivens 1-B, sd 1440 ft. Watchorn Oil Co.'s Cable 1, rigging up. Wilson et al's Johnson Bros. 1, rigging up.

MOORE COUNTY—Producers & Refiners Co.'s Masterson 1, lcn.

POTTER COUNTY—Producers & Refiners Co.'s L. Bivens 1-A, ur 2800 ft; Bivens 2-A, sd 1260 ft; Masterson 2, sd 2990 ft.

ROBERTS COUNTY—Roy Schenck et al's O. Laughlin 1, sd 60 ft.

WHEELER COUNTY—Mid-Continent Oil

LUCEY

CHROME FISH TAIL BITS

Are steadily growing in favor. **Every user of Lucey Chrome Fish Tail Bits is a satisfied customer**

WHY?

1. Because they are made from the right steel.
2. Because they are forged at the right temperature under scientific control.
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4. Because they are properly machined.
5. Because **they reduce your cost of Fish Tail Bits per foot of hole drilled.**

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STEEL

STANDARD

Seamless Casing

Equipped With Seamless Steel Couplings

6-⅝" and smaller

Prompt Delivery

Better than ordinary casing for shallow wells; an absolute necessity for deeper holes.

Standard Seamless Tube Co.

Pittsburgh, Pa.

Hawkins 1, 10-11-31, sd 960 ft. Red River Valley Oil Co.'s Taylor 1, 29-13-29, sd 2790 ft.

MILLER COUNTY — Cochran & Ray's Adams 1, 4-14-27, sd 2850 ft. Kingsley et al's Thompson 1, 33-14-28, sd 500 ft.

NEVADA COUNTY—Arkrado Oil Co.'s McCain 1, 36-10-23, rig. Anderson & Edward's Eaves 1, 11-12-23, sd 180 ft. Carter et al's Bailey 1, 31-13-21, sd 400 ft. Miller-Burnham-Hawley Synd.'s Perry 1, 12-15-22, sd 545 ft. Prescott Oil Co.'s Henry 1, 10-12-20, sd 2406 ft. Steele & Sandlin's Martin 1, 13-14-22, sd 2420 ft. Transcontinental Oil Co.'s Blakeley 1, 14-13-20, dr 2590 ft. Wooten et al's Moore-Martin 1, 9-13-20, sd 1225 ft.

OUACHITA COUNTY — Eck & Boger's Criner 1, 21-15-19, dk. Foster et al's Harvey 1, 32-11-19, dk. Hopkins et al's Allen-Curry 1, 33-14-19, sd 2050 ft. Leeper et al's Wesson 1, 23-15-19, set 2½-in tubing on packer; well flowed about 3 barrels; now wosr. Peltier et al's Eagle 1, 25-12-16, sd 2000 ft. Pure Oil Co.'s Moline 1, 21-11-17, fsh 2415 ft. Riley et al's Henry 1, 10-11-16, sd 2072 ft. Smackover Creek Oil Co.'s Moon 1, 32-15-17, set 6-in and sd 1861 ft.

UNION COUNTY—Bondurant et al's Clark 1, 34-17-12, to set 4½-in 2655 ft; Turbeville 1, 9-18-12, sd 1610 ft. Garrett et al's Robinson 1, 33-18-14, sd 2464 ft. Harrell Trust's Steele 1, 11-19-12, sd for cas 2435 ft. Quaker City Pet. Co.'s Salome 1, 14-17-15, dr 2125 ft. Ray et al's Long 1, 28-16-14, sd 1960 ft. Starke et al's Little 1, 21-19-12, sd 2220 ft.

Louisiana Wildcats

COMPLETION

Company, Well, Location	Initial Production Bbls.	Depth
Bienville Parish—		
Hodge-Hunt Lumber Co. Fee 3 31-15-5	*	277

DRILLING REPORT

BIENVILLE PARISH—Ohio Oil Co.'s Bodcau 1, 19-16-6, dr 2420 ft. Smith et al's Durrett 1, 34-18-5, dk. Smith et al's Harrell 1, 6-18-5, dk.

BOSSIER PARISH—Atlantic Oil Producing Co.'s Bolinger 1, 38-23-11, lcn. Skannal et al's Fee 1, 22-17-12, sw 2590 ft; plugged back to 2450 ft. Sneed et al's Jones 1, 23-18-11, sd 400 ft. Tarver Pet. Co.'s Bolinger 1, 15-22-14, sd 2657 ft. Zink & Kurbert's McGuffin 1, 4-18-11, sd 260 ft.

CADDO PARISH—Brewer et al's Sharp 1, 15-18-16, r 2445 ft. Caddo-Western Gas Co.'s Gardner-Blades 1, 2-16-15, sd 2050 ft. Crude Oil Co.'s Alexander-Ledbetter 1, 27-16-14, sd 1510 ft. Humble O. & R. Co.'s Youree-Randolph 1, 24-20-15, fsh 2892 ft. Louisiana Pet. Co.'s Brewer 1, 33-23-16, dr 2000 ft. Matson et al's Nickerson 1, 30-19-15, dk. Myra et al's Roberts 1, 34-23-15, sd 2810 ft.

CALDWELL PARISH—Culver et al's Culver 1, 21-14-4e, rig.

CLAIBORNE PARISH — Triangle Drilling Co.'s Ranich 1, 17-22-5, sd 2650 ft.

DE SOTO PARISH—Caldwell et al's Welch 1, 7-14-10, dr 1765 ft. Terrell et al's Porter 1, 22-12-13, rig; Porter 2, 15-12-13, dk tmbrs. Ulrey et al's Frost-Johnson 1, 3-11-15, to set 8-in 1500 ft; to 1800 ft.

LA SALLE PARISH — Helm & Burch's Urania 1, 21-11-3e, dk. Urania Pet. Co.'s Urania 2, 20-10-2e, sd 2120 ft; Urania 3, lcn.

LINCOLN PARISH—Bickner et al's Colvin 1, 35-20-2w, dk. Four Creeks Oil Co.'s Colvin 1, 35-20-3w, sd 950 ft. Middlefork Synd.'s Kay 1, 8-20-3w, casing stuck; td 2356 ft.

RED RIVER PARISH—Coushatta Synd.'s Marsten 1, 24-12-10, sd 2250 ft.

UNION PARISH—Arkansas Nat. Gas Co.'s Templeton 1, 19-23-1e, rig. Cargile et al's Heard 1, 25-21-3w, dk tmbrs. Clark & Woodward's Clark 1, 17-23-2e, set 6-in 2174 ft. Davidson & Palmer's Green 1, 19-23-1e, set 6-in 2220 ft; drilled plug and bailed casing dry; drilling in to test. Empire Gas & Fuel Co.'s Hamilton 1, 30-19-1e, dr 3310 ft. Evans et al's Cole 1, 16-22-2e, lcn. Lide et al's Templeton 1, 18-23-1e, lcn. Neddo Petroleum Investment Corp.'s Smith 1, 2-23-3w, rig. Noe et al's Gulley 1, 36-21-1e, dr 100 ft. Ohio Oil Co.'s Dubach Lumber Co. 1, 15-20-1w, rig. Roxana Pet. Co.'s Smith 1, 30-22-2w, rig. Tarver et al's Rhodes

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"Where the Reliable Oil Well Supplies Come From"

Franklin, Penna.

PUMPING EQUIPMENT

Team Work

B. C. Forbes says, "Civilization is built on team-work," and so is BANKING.

When the Oil Man helps the Bank, he enables the Bank to help him.

This Bank performs many services for its clients which we'd like to have you inquire about.

A Bank of Personal Service

Commercial National Bank
Shreveport, La.

1, 30-21-1w, dk. Union Parish Drilling Synd.'s Fee 3, 17-23-1e, sd 2287 ft.

WEBSTER PARISH—Cotton Valley Synd.'s Merritt 1 and 2, 14-21-10, lcns. Fortuna Oil Co.'s Pruitt 1, 17-21-9, rig; Stratton 1, 31-22-10, rig. O'Brien et al's Dales 1, 26-21-9, dr 1510 ft. Oil Fields Gas Co.'s Hope A-1, 13-21-10, set 6-in 2393 ft; Hope B-1, B-2, and B-3, lcns. Palmer & Blount's Anders 4, 6-18-10, sd 825 ft. Palmer Corp.'s Miller 1, 29-21-10, to resume dr 3378 ft. Snyder et al's Hodges 2, 15-21-10, dk. Standard Oil Co.'s Woodward & Walker 1, 16-17-8, dr 925 ft. White Oil Corp. and J. K. Wadley's Gleason 1, 31-22-9, lcn.

North Texas Wildcats

(Note—This report does not include tests that have been shut down indefinitely.)

BAYLOR COUNTY—Wurtz et al's Porter Ranch 1, sd 1010 ft.

CLAY COUNTY—Crude Oil Prod. Co.'s Kinder 1, dr 1115 ft. J. T. Cumley et al's J. D. Stine 1, dk. E. C. D'Yarmett's Carpenter 1, sd 2000 ft. Gulf Prod. Co.'s H. Boddy 1, fsh 2800 ft; C. M. Worsham 3, dr 900 ft. Lone Star Gas Co.'s N. H. Martin 1, dr 700 ft; Withers 2, dr 300 ft. Nebraska Oil & Gas Co.'s W. H. Myers 1, dr 3310 ft. Nix-Moore Oil Co.'s F. M. Hull 1, sd 1500 ft. Seaboard Oil & Gas Co.'s L. Zihlman 1, dk.

COOKE COUNTY—Big Indian Oil Co.'s B. W. Davis 1, sd 2790 ft. Red River Drilling Co.'s Whaley Jones 1, sd 1300 ft.

DENTON COUNTY—Hill Crest Oil & Dev. Co.'s J. H. Rayzor 1, sd 1350 ft.

GRAYSON COUNTY—Zee Tex Oil & Dev. Co.'s G. W. Cannon 2, sd 2960 ft; Griffin 1, sd 2225 ft.

HARDEMAN COUNTY—Frizell Oil Co.'s M. S. Winbury 1, sd 3075 ft.

KING COUNTY—Banks Oil Co.'s J. R. Hailey 1, sd 1630 ft.

KNOX COUNTY—Brazos Bend Oil Co.'s J. E. Clark 1, dr 1875 ft. White Oil Corp.'s Ward Ranch 1, sd 2810 ft.

MONTAGUE COUNTY—Bowie Chief Oil Co.'s C. H. Boedeker 1, sd 2725 ft. Gulf Prod. Co.'s T. Benton 1, dr 3110 ft. Humphreys Oil Co.'s J. W. Maddox 3, sd 1950 ft. Mascho Oil Co.'s J. L. Howard 1, dr 2200 ft. Rycade Oil Co.'s R. D. Beasley 1, fsh 3030 ft. Spencer & D'Yarmett's Wilson 1, sd 1080 ft. Texon Oil Co.'s L. Crenshaw 1-A, sd 2300 ft; L. Crenshaw 1-B, sd 1225 ft. The Texas Co.'s C. W. Rucktashel 1, dr 275 ft.

Texas Panhandle Wildcats

(Note—The drilling report below does not show wells that are shut down indefinitely.)

ARMSTRONG COUNTY — Magnolia Pet. Co.'s Adair Est 1, sd 3950 ft.

CARSON COUNTY—Culbertson Bros.' V. B. Armstrong 1, sd 175 ft. Gulf Prod. Co.'s S. B. Burnett 3, sd 3150 ft. Humphreys Oil Co.'s J. M. Sandford 1, sd 2535 ft. W. W. Silk et al's S. B. Burnett 3, dr 2100 ft. The Texas Co.'s Mary C. Burnett 1, sd 40 ft; S. B. Burnett 3, dr 1725 ft. Tipton, Stone et al's McConnell 1, sd 3028 ft.

GRAY COUNTY—W. H. Holmes et al's J. S. Morse 1, sd 915 ft. The Texas Co.'s G. H. Saunders 1, testing cas, td 2375 ft.

HEMPHILL COUNTY—Piney Oil Co.'s Hopkins 1, dr 3050 ft.

HUTCHINSON COUNTY—Coline Oil Co.'s M. Sandford 1, sd 3220 ft. Humphreys Oil Co.'s Johnson Bros. 1, fsh 2600 ft. Montgomery Oil Co.'s Johnson Bros. 1, dr 1800 ft. Plains Oil Co.'s I. F. Weatherly 1, sd 3260 ft. Producers & Refiners Co.'s L. Bivens 1-B, sd 1440 ft. Watchorn Oil Co.'s Cable 1, rigging up. Wilson et al's Johnson Bros. 1, rigging up.

MOORE COUNTY—Producers & Refiners Co.'s Masterson 1, lcn.

POTTER COUNTY—Producers & Refiners Co.'s L. Bivens 1-A, ur 2800 ft; Bivens 2-A, sd 1260 ft; Masterson 2, sd 2990 ft.

ROBERTS COUNTY—Roy Schenck et al's O. Laughlin 1, sd 60 ft.

WHEELER COUNTY—Mid-Continent Oil

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STEEL

Synd.'s Ember 1, lcn. Roy Schenck et al's J. F. Bradley 1, lcn. Skelly Oil Co.'s Davis Bros. 1, dr 3210 ft. H. C. Tyrell et al's F. E. Sheldon 1, dr 1520 ft. J. Whittington's Williams & Laycock 1, sd 1950 ft.

Central West Texas Wildcats

COMPLETIONS

Company, Well, Location	Initial Production Bbls.	Depth
Callahan County—		
Duffey et al Parks 5	10	425
Edgette Pet. Co. Woody 1	*	2005
Lane et al Diller 1	*	785
Manley-Borealis H. Wagley G-4	10	358
F. W. Stone & Slick S. C. Barr 1	¶4	1423
Schaffner et al Henry James 1	*	2645
Coleman County—		
Case Oil Co.'s Frick 1	*	955
Roth & Farrout Mrs. Clara B. Starr 1	*	4303
Mitchell County—		
The California Co.'s E. Morrison-Riley 1	40	3055

DRILLING REPORT

BROWN COUNTY—Carlton-Tippett et al's O. B. Fomby 1, sd 1315 ft. Crabb, McNeil & Bryant's B. W. McDonough 2, lcn. Joe Cullinan et al's G. W. Pickett 1, sd 1135 ft. Infield Pet. Co.'s T. M. Windham 4, dr 1880 ft; Windham 5, rigged up and sd. Leonard et al's Prather 2, sd 2275 ft. Maher Bros. Bohara 1, sd 2155 ft. Omaha Southern Oil Co.'s G. B. Gaines 2, sd 1690 ft. Price et al's Blair 2, sd 2910 ft. Pennant Oil & Gas Co.'s W. B. Strickland 1, sd 2605 ft.

HOOD COUNTY—Corsicana Oil & Ref. I. A. Rylee 1, dr 720 ft.

PALO PINTO COUNTY—Bankhead & Wheeler's Bankhead 1, sd 275 ft. Ed Costello's Costello 1, co after shot 2705 ft. Clark & Burch's Mrs. L. F. Conklin 1, sd 3955 ft. Jack Dalton Oil Co.'s R. S. Dalton 2, sd 4025 ft; Dalton 5, sd after shot 4060 ft. Dalton-Bell & Wells' R. S. Dalton 1, lcn. E. Hess et al's Crocker 1, dr 980 ft. Hughes, Craig & O'Neil (was Jones) Jones 1, dr 3735 ft. Moore & Sneboldt's Pruitt 1, dr up bailer 1800 ft. S. W. Manning et al's R. Hitson 1, sd 3640 ft. Nelson Oil Co.'s Finch 2, plugging back from 4160 to 3300 ft for shot. Pender Prod. Co.'s L. C. Slemmons 1, dr 4080 ft. Phillips & Graham's J. A. Caudill 1, sd 2350 ft. Simms Oil Co.'s Costello 1, co after setting 6-in cas, td 3825 ft. Scott & McCluer's Riverbed 1, sd 3712 ft; Riverbed 2, rigged up and sd. H. L. Singleton et al's W. Holt 1, dr 3235 ft. Skelly Oil Co.'s Carter 1, rigged up. Texas Pacific Coal & Oil Co.'s M. E. Robinson 1-DD, sd 3583 ft; J. N. Stewart 144, sd 1695 ft; J. H. Robinson 7, lcn. Upham Gas Co.'s Watson 4, lcn. Youkan Oil & Gas Co.'s Seaman 1, sd 3965 ft. Zada Belle Oil Co.'s G. N. Weldon 1, making 4,000,000 cu ft gas along with spray of water and some oil, from sandy lime pay at 3890-91 ft, dr 3940 ft.

CALLAHAN COUNTY—Byron-Union Oil Co.'s Hennessey 1, sd 3970 ft. Dudley Oil & Gas Co.'s Hugh Moore 1, sd 1750 ft. Chas. Dutton et al's Mrs. Luke Cathey 2, dr 965 ft. Hickey et al's E. L. Findley 2, dr 2270 ft. Junior Oil Co.'s Thorn 1, sd 2415 ft. Moore et al's Acker 2, showing oil and gas, dr 2520 ft. T. B. Slick's H. P. Faukner 1, showing oil, dr 2495 ft. F. W. Stone & Co.'s H. P. Faulkner 1, tmbrs. F. W. Stone & Slick's C. W. Barr 1, dr 650 ft. Shackelford et al's Chas. Allen 1, dr 1575 ft. Andy Urban's Ramsey & Estes 1, lcn abn.

BORDEN COUNTY—Kesselman Dev. Co.'s A. J. Long 1, rigged up.

BREWSTER COUNTY—Arco Dev. Co.'s H. L. Kokernot 1, re-setting 5 3/16-in cas 3765 ft. Brewster Oil Co.'s H. L. Kokernot 1, sd 2535 ft. Portland Oil Synd.'s State 1, sd 2765 ft. Nine Points Oil Co.'s Peralto & Finnell 1, sd 1570 ft. Marathon Oil Co.'s Nigger Creek 1, sd 2350 ft; Wilson 2, sd 4000 ft.

COKE COUNTY—Ace Oil Co.'s W. C. Locke 1, spd and sd. Atkins Oil Co.'s J. R. Smith 1, lcn. Mexia-Equitable Oil Co.'s W. J. H. Hodges 1, sd 2505 ft.

CONCHO COUNTY—Signal Oil Co.'s Sam Waring 1, sd 3040 ft. W. O. Schultz Oil Co.'s Schultz 1, sd 3225 ft.

CROCKETT COUNTY — Crockett County Drilling Synd.'s J. M. Shannon 1, sd for drill stem, td 1970 ft; Shannon 2, lcn; Robt. Massey 1, sd 510 ft. Enders-Smith & Co.'s University 1, sd 810 ft.

CULBERSON COUNTY—J. D. Wesner's Mack Sayles 1, sd 3105 ft. Consolidated Sulphur Co.'s Johnson 1, sd 115 ft.

DAWSON COUNTY—Lamesa Oil Co.'s John Burns 1, sd 2155 ft.

ECTOR COUNTY—Farmers Oil Co.'s Andy Newham 2, sd 1400 ft.

EL PASO COUNTY—Cinco Minas Co.'s Burns & Knight 1, sd 4030 ft.

FISHER COUNTY—Pyron Oil Co.'s J. S. McCall 1, sd 3125 ft.

GLASSCOCK COUNTY — Cushing Ranch Drilling Assn.'s W. H. Sparkman 1, sd 1950 ft. General Oil Co.'s L. S. McDowell 4, sd 3685 ft. Associated Ref. & Prod. Co.'s C. I. Brunson 1, sd 2935 ft.

HUDSPETH COUNTY—Boole Oil Assn.'s Gardner et al 1, sd 1540 ft. Hueco Basin Oil Co.'s University 1, sd 2555 ft. William Loftus et al's Minnie Veal 1, spd and sd.

HOWARD COUNTY—Big Springs Oil Co.'s Mabel O. Quinn 1, sd 3640 ft.

JONES COUNTY—Anson Oil & Dev. Co.'s C. B. Brown 1, sd 1855 ft. C-H Oil Dev. Co.'s J. A. Cullom 1, sd 3150 ft.

LOVING COUNTY—Ramsey Prod. Co.'s Russell 1, sd 4485 ft; Russell 2, sd 810 ft.

MITCHELL COUNTY—The California Co.'s W. H. Abrams (T. & P.) 5, tmbrs; W. H. Butler 1, dr 500 ft; A. L. Miller 2, dr 1300 ft; Earl Morrison 1-A, dr 3960 ft; Morrison 2-A,

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dr 65 ft; Earl Morrison 6-B, rigged up; L. C. Le Sure 2, lcn. J. F. Carey et al's Earl Morrison 1, tmbrs. Colorado-Texas Pet. Co.'s W. L. Foster 2, sd 2625 ft. C. F. Kelsey et al's W. H. Badgett 1, sd for storage after shot, td 3120 ft. S. A. Sloan Oil Co.'s Sam Smart 2, dr 2750 ft.

PECOS COUNTY—Trans-Pecos Oil Co.'s Helen L. Thomas 1, setting 15½-in cas 410 ft; Bennette et al 1, sd 865 ft; Turney 1, sd 1630 ft; Johnson 1, rigging up to drill to 450 ft, td 3520 ft. Southern States Lease & Prod. Co.'s J. M. Odem 1, sd 1305 ft. Oregon-Texas Oil Co.'s Turney 1, sd 3025 ft.

PRESIDIO COUNTY—Claude Byler's Toole Est 1, dr 455 ft.

REAGAN COUNTY—Big Lake Oil Co.'s University 2, dr by junk, td 2770 ft; University 5, rigged up; University 6, lcn; University 7, lcn. Mid-Kansas Oil & Gas Co.'s McIntosh 1, lcn.

REEVES COUNTY—Dixieland Oil Co.'s Oates 2, sd 4505 ft. W. S. Troy et al's H. G. Hersheursen 1, sd 415 ft. Bell Reeves Oil Co.'s Findley et al 1, sd 1540 ft. El Paso Saragosa Oil Co.'s George Wirt 1, sd 540 ft. Parker-Hancock Oil Co.'s Johnson 1, sd 1930 ft. Willoughby Pet. Co.'s W. D. Cowan 1, sd 610 ft. Rodenbaugh & O'Connell's W. D. Casey 1, sd 845 ft. Pico Pet. Co.'s Johnson 1, sd 1930 ft. Texas Drilling & Dev. Co.'s Pecos Valley 1, sd 1105 ft.

RUNNELS COUNTY—Safety First Oil Co.'s Wilk Allen 1, plugging to abn 4000 ft. Russell Prod. Co.'s Russell 2, sd 2500 ft.

SCHLEICHER COUNTY—Paragon Oil Co.'s B. M. Boyd 1, setting 5 3/16-in cas, td 3055 ft.

SCURRY COUNTY—The Loutex Corp.'s J. J. Moore 1, fsh cas, td 3576 ft. Col. A. E. Humphreys et al's H. P. Welborn 1, rigged up. Camp Springs Oil & Gas Co.'s L. E. Howell 1, lcn; W. R. Quinn 1, sd for cas 2035 ft; W. V. Jones 1, sd 605 ft. Hermleigh Oil & Gas Co.'s J. W. Burris 1, sd 3005 ft. Stanton Oil & Gas Co.'s J. W. Riley 1, sd 3505 ft. C. C. Brandon's J. A. Kemp 1, lcn. J. O. Guinn's L. Sturdevant 1, lcn.

STERLING COUNTY—Co-Operative Lease & Dev. Co.'s Douthitt 1, sd 1815 ft. Chicago Oil & Gas Co.'s B. C. Durham 1, showing oil at 1445 ft, sd 1500 ft. Fidelity Oil Co.'s C. R. Hull 1, sd 1215 ft. Concho River Drilling Assn.'s George McIntyre 1, sd 505 ft.

TAYLOR COUNTY — Abilene-Texas Oil Co.'s J. C. High 1, sd 2135 ft. Sanger Oil & Ref. Co.'s Hall 1, sd 3050 ft.

TERRELL COUNTY—Southwest Texas Oil & Gas Co.'s S. W. T. No. 1, 3470 ft. Pittsburgh-Western Oil Co.'s Chas. Downey 1, sd 1260 ft.

TOM GREEN COUNTY—Ranger Investment Co.'s Harris 1, sd for 4-in cas 3116 ft with small showing of oil and hole full water.

VAL VERDE COUNTY—East Del Rio Oil Co.'s E. F. Russell 1, sd 1815 ft. G. Cook et al's Bedell Moore Est 1, sd 1255 ft. Independent Operators' Whitehead 1, sd 1805 ft. Re-Clamation Oil Prod. Co.'s J. B. Moore 1, sd 2630 ft.

WARD COUNTY—Arthur Pitts Oil Co.'s Soda Lake 1, sd 2205 ft; River 1, sd 4675 ft. Cook & O'Brien's G. W. O'Brien 1, sd 1175 ft. Trans-Pecos Oil Co.'s Longnecker 1, sd 1765 ft.

San Antonio District Wildcats

ATASCOSA COUNTY—DeLange-Eiser Co.'s Tom 2, preparing to set 6-in cas.

JIM HOGG COUNTY—Las Animas Oil Co.'s Holbein 1, dr; Holbein 3, dk. Miami-Balderas Oil Co.'s 1, dr. Revere Oil Co.'s Davenport 1, dr. Diamond S Oil Co.'s Doering 1, dr below 3000 ft. Homer & Tyson's Tyson 1, recementing. Weber Oil Co.'s Holbein 3, dr 3000 ft. Caprock Oil Assn.'s Nolkemper 1, cas set. J. W. Pippin's 2, preparing to dr deeper.

LIVE OAK COUNTY—Grubstake Investment Assn.'s 3, lcn. Lobo Oil Co.'s Reagan 6, dr 1006 ft. Harkey Oil Corp.'s Herring 1, dr 760 ft. Houston Oil Co.'s Cartwright 3, gasser at 2350 ft. McCoy's Ross Murray 3, lcn.

MEDINA COUNTY—Mayor Wheless' Jose de la Roche 1, dr. B. J. K. Co.'s Adams 1, flowing oil and water at 1100 ft. California-Medina Assn.'s Rothe 1, dr 2200 ft. William Oil Co.'s Jungmann 1, sur 104, dr 300 ft. Middle States Oil Co.'s 1, sur 799, lcn. O'Bryan et al's Nixon 1, sur 14½, dr 400 ft. Charles Jackson et al's Adams 1, sur 12, lcn; Jake Wolff et al's Louis Moefield 1, sur 532, plugging back. Young et al's Tom Bendle 1, dr. William Metzker's Ward 1, dk. Carl Bros.' Durst 1, sur 14, waiting on cas. Ina Oil Co.'s Durst 3, lcn. Fuch's Jungman 1, sur 13, dr. Herman Haught's 1, sur 459, waiting on cas at 600 ft. Dr. Brown et al's Adams 1, sur 12, dr below 350 ft.

McMullen County—Pioneer Prod. Co.'s Lowe 1,, dr. Burt Oil Co.'s Calliham 1, dr. Charles G. Bowers' Fisher 2, preparing to set 100 ft perforated pipe. Pioneer Consolidated Pet. Co.'s Martin 1, dr 1681 ft. Lightfoot & Hill's Aycock 1, dr 1500 ft; Stitz 1, coring. Dilliham & Thorman's H. T. Calliham 1, dk. Corpus Christi Oil Co.'s Barnes 2, dr. W. E. Elliott's Stitz 1, down below 745 ft. Foley & Delaham's H. T. Calliham 1, dk. Laughter & Naiper's Stitz 1, spudded in and set 10-in surface cas. South Texas Co.'s H. T. Calliham 1, reported producing. Grubstake Investment Association's Lark 2, dr below 700 ft; Lark 3, cementing at 654 ft. George Smith's Fisher 1, dr in sand.

SAN PATRICIO COUNTY—Aransas Pass Live Oak Ridge Co.'s Sigmund 3, dr. Rockport Oil Co.'s 2, dr.

J. Edgar Pew, vice president and in active charge of the Sun Oil Company, and Harry Maxwell of the land department, departed from headquarters of the company at Dallas last week on a business trip to California.

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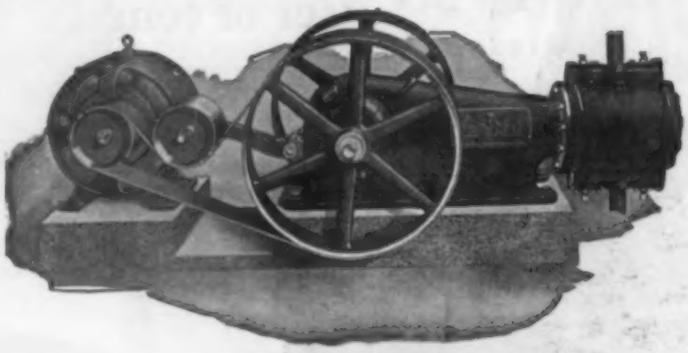

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COMING NEXT WEEK

THE SIXTH ANNUAL STATISTICAL EDITION of The OIL WEEKLY will be out next week, January 19. It will contain, in addition to regular features, the following:

1. Production of various oil fields of the United States by fields and months during 1923.
2. Reports on number of failures and producing oil and gas wells in the United States, by fields, during 1923, with initial production in each field.
3. Statistical information on the production of each oil section (by states, fields or pools) since oil was first discovered, down to date.
4. Production figures on every country producing oil, since oil was first produced in each country.
5. Comparative drilling and production costs at the close of 1923 and former years in principal sections of the United States.
6. Review of important new fields brought in in 1923, with brief forecast of their possibilities in 1924.
7. Charts on accumulation of oil stocks, consumption, production, etc. (Several pages of such charts are now being prepared by a nationally known authority on oil.)
8. Forecasts on possibilities in California, Texas and Oklahoma, where over production seriously affected the industry in 1923.
9. Review of important developments in foreign fields, with brief forecast as to possible future production of the various countries, based on present drilling.
10. Several articles on engineering problems affecting oil production and transportation, including three articles by nationally known petroleum engineers.
11. Review of important developments in drilling methods and equipment in 1923.

This issue will be the best issue of The OIL WEEKLY in 1924. It will carry articles and statistics you will want to refer to many times and will be a valuable addition to your library. The price of this Annual Statistical Issue on news stands will be 50c per copy. You can get this issue along with 51 other live issues by sending in One Dollar for a year's subscription to The OIL WEEKLY.

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Drilling Development in English Fields

(Continued from page 30)

2640 feet and at the top of the Limestone the upper 6 feet showed colors and had a very live odor, but looked too soft to shoot.

The Hardstoft well was placed on top of a well-defined dome trending for over a mile to the northwest, and to the southeast continuing for many miles with plunging axis. The usual dips are 5 degrees to 10 degrees but on the southwest flank these locally reach 20 degrees. Just west of the well, and paralleling the axis is a 50 yard fault. The location was placed with the intention of encountering this fault where it intersected the Limestone. There was not much data available for calculating this intersection, and during the drilling there was good reason to believe that the fault zone was passed through between 1350 and 1550 feet in depth which would give the fault plane a dip of 60 degrees and cause it to strike the Limestone 1000 feet to the east. The well started in the productive coal measures, reached the lower at 444 feet, the Grits at 1533 feet(?) the Limestone Shales at 2710 feet, and the Limestone at 3077 feet. When the well passed through the faulty zone, some colors of oil and puffs of gas occurred, with water. On top of the Limestone, beneath a hard shell, oil was found in May, 1919, in a sandy limestone probably not exceeding 5 feet in thickness. There was only a little gas present and it required eleven days for the oil to fill the 8-in. casing and overflow. The oil continued flowing at a very uniform rate all the time the writer was present (until the fall of 1921) and showed little decline. Two years after coming in, the well was given a pumping test, after which the oil rose to the surface in 15 days. The well was drilled 50 feet below the sand to 3130 feet without altering the production.

According to information supplied by H. M. Petroleum Department the production of the well has been as follows:

	U. S. Barrels
May to December, 1919	1666
Year 1920	2909
Year 1921	2652
Year 1922	974

The sudden decline in 1922 is thought to be due to the necessity of cleaning out, as the oil is high in wax and the sand is protected from the overlying cavey shale only by a few lengths of perforated 6-in. liner. No attempt has been made to increase the flow by shooting or cleaning out. In character the oil resembles Pennsylvania crude in certain respects. It has a gravity of 40 degrees Be. and analyzes by steam distillation as follows:

	Per Cent	Specific Gravity	Deg. Be.
Gasoline	10	0.720	65
Kerosene	30	0.7835	48
Lt. lubricat. oil and wax	30	0.838	37
Heavy lubricat. oil	30	0.893	27

Sulphur 0.42 per cent. Wax (melting point 104° F.) 3.25 per cent.

In 1920, when Pennsylvania oil was selling at $6.10 per barrel, about 4000 barrels of the Hardstoft oil were sold to relieve the storage tank for price of 22:10:0 pounds sterling per ton or about $14 per barrel at normal exchange rates.

The Heath well was located on top of an elongated dome which is an offshoot trending in a northerly direction from the Hardstoft fold, the two being connected by a saddle. A mile north of the well the axis begins to plunge and may connect with the Brimington anticline; several hundred yards east of the well is an axial fault having an east downthrow of 50 yards. The well started fairly high in the productive coal measures. The lower coal measures were reached at 1025 feet, the Grits at 2040 feet, the Limestone Shale at 3455 feet, and the Limestone at 3942 feet, the hole being carried to a depth of 4014 feet. At 264 feet a 50,000 foot gas flow was encountered; and at 1873 feet, near the base of the lower coal measures, a 12 foot sand yielding about 400,000 cubic feet per day. The latter was used for some months under boilers and in the camp. Again at 2864 feet, in a 5 foot sand between two water horizons, a 75,000-ft. flow was found. At the top of the Limestone, a small oil showing was obtained; this had a gravity of 42 degrees Be. and resembled a filtered variety of Hardstoft oil. The showing was shot with 400 pounds of dynamite, and later with nitroglycerine. As the laws of the country forbade the transportation of this explosive, the fluid was leached with water from dynamite on the spot. Neither of these shots was successful in increasing the showing.

The Brimington well was placed on top of a dome developed on the crest of the Brimington anticline, which has a length of 8 miles and north of the location curves into a west of north trend; lower coal measures form the crest and productive measures the flanks. At least two domes are developed on the fold, the one tested having a closure of several hundred feet. The Grits were entered at 1010 feet, the Limestone Shales at 2420 feet, and the Limestone at 2995 feet. Gas was found at 1075 feet in the top of the Grits beneath a water sand; it was under sufficient pressure to make the water overflow and caused a subsequent collapse in twelve and one-half inch casing. The gas contained carbon dioxide, 0.40 per cent; methane 79.82 per cent; and nitrogen (by difference) 19.78 per cent. Gas and oil colors were found at 1430 feet and "wet" gas at 2215 feet. In drilling through the lower 400 feet of Limestone Shales colors of oil and puffs of gas were frequent, but the Limestone itself was barren except for a few positive sample tests. Toadstone was found at 3200 feet interbedded with limestone. The toadstone beds totaled about 700 feet between here and the bottom, 4040 feet, which was in limestone. At 3670 feet, the beds carried considerable anhydrite for 100 feet.

The Renishaw well was located on a terrace formed in the easterly dipping coal measures. The dips were under 5 degrees as a rule, and the structure had little if any closure. The lower coal measures were reached at 584 feet, the Grits at 1950 feet, and the Limestone Shales at 3400 feet. The top of the Limestone was not sharply defined, as in the other wells. Beds of limestone began to appear at 3978 feet but the main mass was not reached until 4130 feet. Some oil colors were noted at 1490 feet and at 1580 feet a gas sand producing 200,000 feet. At 1615 feet more gas was encountered in a sand, the total flow from the two places amounting to 750,000 cubic feet per day. These were shut off with mud fluid. At 2020 feet there was some "wet" gas, and at 3978 feet a show in limestone. The lower 300 feet of Limestone Shales yielded frequent oil colors and the tools would come up spotted with it. The final depth was 4185 feet.

The Ridgeway, or most northerly, well of the Derbyshire group was located on a large plunging fold trending south of east. A mile west of the well the axis flattened and developed some closure, while a fault giving some hundred feet of closure was present to the west of the well. The hole started in an area of lower coal measures. The Grits were entered at 1090 feet(?), the Limestone Shales at 2500 feet, and the Limestone at 2810 feet. A little gas was met at 475 feet. At 2888 feet in the Limestone, sulphur water was found, which overflowed at the rate of 200 barrels per hour. The water temperature at the top was 110 deg. F. at first and increased in a day or two to 120 deg. F. as the ascending water heated the strata and so lost less heat by radiation. The water had medicinal qualities and efforts were made to dispose of the fluid for commercial purposes. When shut in with a gate valve, the closed pressure at first registered 56 pounds per square inch, which it maintained for three months and then gradually declined to 30 pounds, around which figure it oscillated to a small degree for some time, until the well was plugged. A noteworthy feature concerning the water flow was that this entered the cellar after flowing from the casing, thence it disappeared down the hole, presumably being absorbed by the strata in the upper parts of the well. The final depth was 2996 feet.

As to the Staffordshire wells on the west side of the Pennines, the most easterly or Werrington was placed on the axis of a fold trending north for 4 miles from the well and south for a much greater distance, in the latter direction the axis having a decided pitch to the south. The location was placed on a flattening about 300 feet below the top of the structure. There was evidence of an axial fault to the west of the well. Along the crest the structure was gentle, but on the flanks it increased rapidly in dip, which in places exceeded 40 degrees. The Meir Hay seepage on the southwest flank has already been mentioned. The well started about 200 feet below the Third Grit and was carried to a depth of 2670 feet through the shales and sandy beds of the Pendleside series without finding the Limestone. The hole was abandoned on account of a fishing job. At 1850 feet a pocket of gas was found, and at 2180 feet, gas and colors of oil.

The Apedale well was located atop a pronounced elongated dome on the west side of the coal field. The fold is 5 miles long with the well in the middle. The closure on the northwest, or weak side, is 900 feet. The crest is a broad gentle flexure but on the west flank there is sudden pitch so that the measures dip almost vertically for 1500 feet and then flatten abruptly with some overthrusting at the base of the pitch in the coal workings. On the east flank, the dip is uniform, 30 degrees to 40 degrees. The fold is faulted, the larger displacements being several hundreds of feet; some of these are

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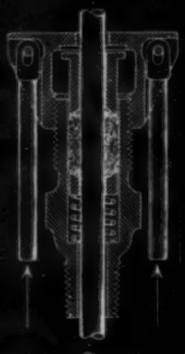

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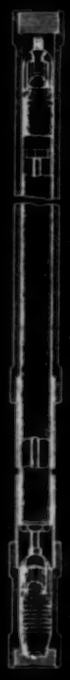

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reported to increase on reaching the synclinal area on the east. One fault system crosses the axis at an angle of 45 degrees, another crosses more at right angles, while the overthrusting on the west flanks parallels the structure. Small seepages in the vicinity have already been mentioned. A surprising and unlooked for development in this hole was the great thickness of volcanic ash encountered. This was entered at 1450 feet and continued to the bottom, 4248 feet, but was a very easy formation to drill. This is by far the thickest volcanic material known in the Carboniferous of England. The ash was reddish in color, basic, and rich in augite. The well started in coal measures and apparently reached the base of the Third Grit at 1050 feet. Some gas was found at 100 feet and a few samples tested positively for oil.

Region of the Scottish Wells
Geology and Structure

Fig. 2 shows, in sketch, the geology of a part of the Carboniferous basin of central Scotland, in which two wells were put down. The basin is flanked on the north and south sides of the Devonian and older rocks. In its broader features, the basin is made up of a large sag forming the Glasgow coal field in the western portion, followed by an uplift to the east of this in the vicinity of Edinburg; the latter in turn is succeeded on the east by another depression, which in its southern part is represented by the Dalkeith coal field. Adjoining the coal field on the east is the fold tested by the D'Arcy well, to the east of which the Carboniferous structure is not well known but the strata are but moderately deformed on the whole.

In this area the Carboniferous is subdivided in descending order as follows:

Coal Measures.—Sandstone, shale and coal seams.

Millstone Grits—Sandstone and grits, thin limestone, coal.

Carboniferous Limestone Series.—Sandstone, shale and limestone, with coal seams developing in the middle portion.

Calciferous Sandstone Series, subdivided as follows:

Oil Shale Group.—Upper part with shales sandstone and thin limestones, carrying most of the commercial oil-shale seams; lower part contains some oil shale, several important sandstone members and shale.

Cementstone Group. — Shales, sandstones, some conglomerate; Arthurs Seat and Carlton Hill volcanic zone, Fig. 2, is at the top. This group grades down into the sediments of the upper old red sandstone, which however, is unconformable with the lower old red sandstone, which in this region contains much igneous material.

The thickness of the above section runs into thousands of feet, but that of individual members is apt to vary from place to place. Igneous material forms a notable part of the Carboniferous. This is more often of a basic character, consisting of flows, ash, sills, and isolated vents. No attempt is made to show all these in Fig. 2.

Practically all the oil shale of Scotland is mined from the formation shown, about 15 miles west of Edinburgh. Some shale was, at one time, mined on the anticline at Straiton, west of the D'Arcy well. The oil shale formation rises from under the measures of the Glasgow coal field to the west and, forming a broad bench, is deformed into pronounced domes usually separated by broad synclines or relatively flat strata. The type of structure developed in the oil-shale field appears to be unique and is confined to the area where oil shale is mined. There is perhaps some significance in this connection. There is some hint that the doming may be due to laccolithic action. Some strong faults are developed, usually normal, occasionally with a throw of 1000 feet or more. The faults along the east side of the Pentland Hills, which is one of the major displacements of the region, is thought to be of the overthrust type. Because of the thick drift which covers the country, the details of the structure often become known only through mining operations, and mapping where surface exposures only are available is sometimes subject to radical change when the underground formations become mined.

Details of the Wells

The West Calder location was placed on the summit of a pronounced dome forming the major feature on an anticline of somewhat longer axis. On three sides the dips vary 25 degrees, but the south side is represented by the plunging axis of the anticline which runs south for several miles with a pitch of 6 degrees. The boring started in the upper oil-shale group and several oil-shale seams were found in the upper part of the hole. These drill like leather. Oil colors were of frequent occurrence down to a depth of 1200 feet, and at 815 feet a 10 foot sand showed heavy oil, enough to give the tools a thick coat whenever passing through. At 945 feet was a 50,000-ft gas sand. It had been expected that several sandstone members known to occur in the lower part of the oil-shale group would be picked up before a depth of 2700 feet was reached, but between 1680 and 2980 feet there was almost continuous mass of ash or agglomerate with some solid igneous, all basic in character. A shale break 100 feet thick occurred at 2500 feet. The occurrence of this ash was unexpected and, so far as the writer is aware, no correlation has been made of this nor the sediments below, which may still be the oil-shale group. Below the ash to the bottom (3918 feet) were shales with some ash streaks, some full of lime.

The D'Arcy well was on a broad moderately folded anticline adjoining the Dalkeith coal field on the east. The fold has a northward trend and is over 8 miles long. Several domes are developed on the structure, the location being on the most important. The Carboniferous limestone series forms the surface. The oil-shale measures underlying this have never been prospected on the fold except by the present boring. In the well, the oil-shale group was entered at a depth of 200 feet and several seams were found. At 724 feet gas was found in a sand; and when measured with the hole partly filled with water and cavings tested 300,000 cubic feet per day. The gas contained methane and ethane 76 per cent; nitrogen 24 per cent. At 905 feet some heavy oil was found in association with

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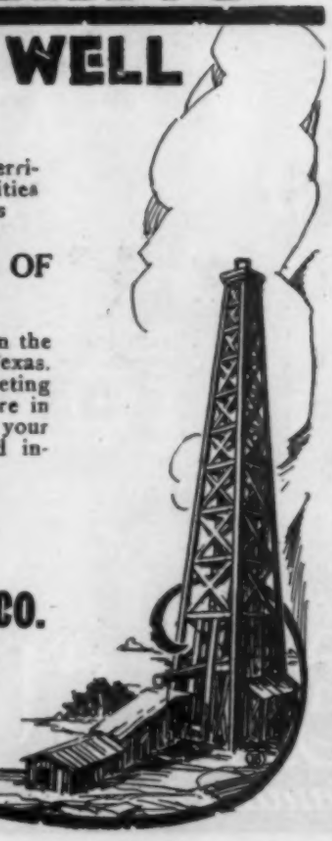

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water in a sand. At a depth of 1810 feet, an encouraging show of oil was found but the well had to be stopped on account of drilling difficulties. This was after the departure of the writer, but he is informed that the oil is of high grade, resembling that at Hardstoft, and over 50 barrels were bailed out. The well is reported standing pending arrangements with private interests to undertake future work.

Variation in Fixed Carbon Content of Coal

During the early stage of the geological work, White's paper on the relation of the fixed carbon percentage in coal to the Appalachian oil and gas fields appeared, and in consequence all available proximate analyses of British coal were secured with the view of applying his results to the problem at hand most of the analyses obtained were for commercial purposes and usually gave no hint as to the method of analysis employed. The data available, therefore, were not as satisfactory as could be desired, as proximate anaylsis do not, as a rule, check unless made by the same method and various methods were in vogue in the data obtained. In a general way, these analyses gave as an average for Derbyshire coal a fixed carbon content of 60 per cent (this figure is herein calculated on the ash- and moisture-free basis), and the same figure seemed to suit the coals of Staffordshire and the Edinburgh area. In the southwest of the country, in the south Wales coal field, the figure was higher, and also in the north of England, in the Durham coal field, where the coal usually went 70 per cent fixed carbon or better.

But although 60 per cent was an average, there was considerable variation in the same section and even in the same seam. Thus the lower workable coal in Derbyshire in the lower coal measures, the Kilburn, was reported by one colliery to run 55.7 per cent fixed carbon, while the Top Hard seam in the same district, 1500 feet higher in the section, gave figures as high as 63 per cent. Again, cannel portions of the Top Hard were as low as 50 per cent. Accordingly, during the progress of the drilling, the writer secured various coal samples from the mines and had them uniformly analyzed by the American method. In the vicinity of the Hardstoft well, the Blackshale coal at the base of the productive coal measures gave 59.1 per cent fixed carbon. The Low Main seam, 200 feet above, went 62.7 per cent; and the Deep Hard, 450 feet above 64.7 per cent; that is, the fixed carbon content decreased with depth. Near the Heath well, the Black-

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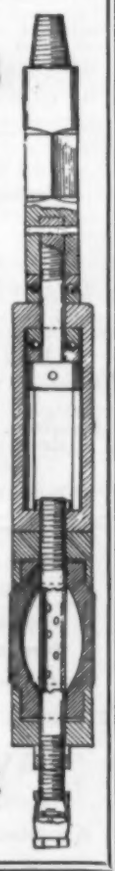

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shale coal at a depth of 1000 feet went 64.4 per cent fixed carbon, while a few miles east at a depth of 2000 feet the figure was 59.5 per cent; but at the latter place the seam was of a cannel variety.

With regard to the variations of percentage in the same seam, samples of commercial grades from the Barnsley, the Top Hard equivalent, from a mine a few miles northwest of Sheffield, were made by the above method with the following results: Cannel, 56.2 per cent; softs, 63.2 per cent; hards, 64.4 per cent fixed carbon.

As to the variation arising from the method of analyses, such as would be liable to enter data of the nature collected, a sample from a coal seam in one of the oil-shale pits at West Calder gave by the American method 51.0 per cent fixed carbon. An analysis of the seam by the company using its method, gave 57.5 per cent. An analysis by the same company of the Hurlet coal, much higher in the section, yielded 61.2 per cent fixed carbon.

The foregoing figures would indicate that caution is needed in using the fixed carbon content of coal as a means of determining the oil prospects of a region, especially if this happens to be a new one or foreign. The assumption made by some, in using coal analyses for this purpose, that the fixed carbon content increases with depth is not borne out by the figures given. The question arises as to how much of the variation of the fixed carbon content is due to metamorphism, and how much to differences in the original character of the coal itself.

Well Temperatures

Thermometer readings were taken at various depths during the drilling of the wells, whenever a suitable opportunity presented itself. It was not always easy to find a well in suitable shape to take a reading, as the action of the bit had the effect of heating the strata, the heat effects being in evidence sometimes for several days. In conjunction with the Mine Temperature Research, Doncaster Coalawners Laboratory, brass cases were designed with spring mountings to hold the thermometers, which were of clinical type. Two cases were used, one inside the other, the object of these and the springs being to lessen the effects of jar in raising and lowering the apparatus on the tools, and to obviate water pressure effects on the mercury bulb of the thermometers. The thermometers, in batteries of two or three, were usually tied to the top of the bailer and left in the hole for 2 hours.

The presence of casing in the hole did not appear to affect the results, neither did the presence of water in the hole so long as it was not flow-

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ing over the top. It should be mentioned that at Ironville No. 1, water was struck at 2417 feet and overflowed at the rate of 10 barrels per day. The water on issuing from the top was cool, of air temperatures. This gave the impression that the water horizon was also cool, but a reading at the bottom of the hole showed a temperature of 103° F., indicating that the water was cooled in its slow ascent in the hole.

These results indicate little or no effects from convection currents in the size of hole used. In the case of strong flows, as at Ridgeway, the water ascended too rapidly to be cooled by the walls.

The results show that the temperature gradient is not uniform in the same hole, nor do the same horizons in the various wells show the same gradient. This indicates that the isothermal surfaces are not planes, but curved or sinuous surfaces.

TABLE I—Well Temperatures

Well—	Depth, feet	Temperature degrees F.	Remarks
Ironville 1....	2400	103.0	Hole full of water
	3555	123.5	Hole full of water
Ironville 2....	1960	89.6	
	3075	119.0	Hole full of water
	3530	127.0	2700 ft. water in hole
Hardstoft	2977	103.0	
Heath	3200	107.5	
	3660	122.0	
	3975	124.0	
Brimington ..	2460	100.0	
	3000	117.5	25 hr. after drilling
	3990	121.5	Hole full of water
Renishaw	1725	87.0	460 ft. water in hole
	2720	104.0	200 ft. water in hole
	3635	119.0	250 ft. water in hole
Werrington ..	1815	71.0	
	2210	80.0	350 ft. water in hole
Apedale	1715	74.5	
	3200	95.5	
	4230	113.0	1500 ft. water in hole
West Calder..	2160	79.0	250 ft. water in hole
	2950	89.0	
	3870	114.5	3200 ft. water in hole

TABLE II—Water Analyses

	Mountain Limestone			Millstone Grits			Lower Coal Measures		Igneous	Oil-Shale Group	
	Ironville 1	Brimington	Renishaw	Ironville 1	Renishaw	Ridgeway	Hardstoft	Renishaw	Apedale	West Calder	D'Arcy
Depth, feet	2462	4040	4185	1433	3198	1115	902	1670	3570	3910	905
Horizon	Middle	Lower	Upper	Middle	Lower	Upper	Middle	Lower		Lower	Upper
Specific grav. at 60° F.		1.003	1.116	1.014	1.127		1.010	1.009	1.1775	1.063	1.004
Constituents reported in	*	*	¶	¶	¶	*	¶	¶	¶	¶	*
Calcium	16.40	54.34	13.85	0.26	15.20	1.60	0.188	0.24	35.97	4.85	10.12
Strontium	0.34	1.16	0.36	0.017	0.67		0.0025	tr.	0.50	0.88	0.46
Magnesium	4.92	9.81	2.96	0.11	2.30	0.30	0.051	0.075	0.12	1.49	3.57
Barium				0.005	0.93					0.48	0.41
Sodium	9.17	38.82	37.40	6.64	40.45	47.84	4.88	4.25	42.33	24.62	181.31
Potassium	0.68	tr.	0.29	0.061	0.15	1.28	0.08	0.046	0.27	0.20	1.46
Lithium	.0.06	tr.	tr.	0.002		tr.		tr.	0.007	tr.	tr.
Ammonia (NH_4)	0.095	0.085	0.11	0.0014	0.085	0.01	0.0075	0.0051	0.012	0.60	0.81
Iron	0.05		0.05		0.023			tr.			
Aluminum					0.009						
Manganese					0.016						
Zinc		tr.									
Bromine		tr.	0.86	0.056	0.965		0.077	0.041	0.76	0.62	2.90
Iodine			0.006		tr.				0.004		
Chlorine	15.04	70.10	90.61	10.78	98.40	20.55	7.88	7.07	131.55	50.70	272.83
Carbonate (CO_3)	8.10	7.70	0.016	0.30		39.30	0.18	0.12		0.04	23.70
Sulfate (SO_4)	.46.23	138.14	0.45	0.012		11.69	0.025	0.12	0.27		5.20
Silica	0.16	2.40	0.002	0.012	0.002	0.96	0.002	0.006	tr.		0.40
Nitrate						2.20					

*parts per 100,000. ¶grams per 1000 gm.

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Wichita Falls, Texas, Jan. 2.—Extending the old Panther pool in Northern Archer County more than half a mile to the east, Riner & Bailey's Wilson 1-A began flowing by heads early this week after drilling into sand at 1616 to 1618 feet, and is estimated good for more than 200 barrels daily. The Panther pool was developed in 1916 and 1917 from the 1600 foot sand and has held up in production unusually good although confined to a small area.

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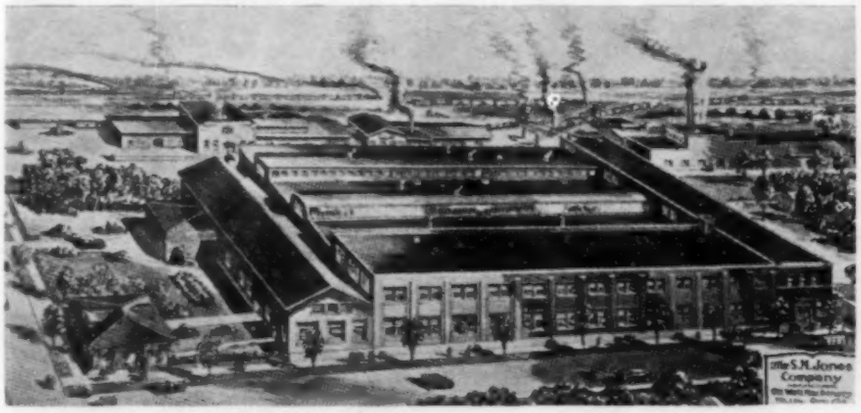

The modern factory of the S. M. Jones Company at Toledo

Toledo, Ohio, Jan. 10.—A good example of how tremendous the demand has grown in recent years for oil equipment is graphically shown in the huge Toledo, Ohio plant, on the S. M. Jones Company.

This company, specializing on sucker rods, has grown until they today cover two city blocks in the city of Toledo—the size and magnitude of the operations and equipment will amaze the visitor—their laboratories devoted to physical testing, their huge specially built forging equipment, the rod warehouses, etc., are all of such size and capacity that the visitor can hardly realize that this plant is devoted exclusively to the production of one article for oil field use.

P. C. Jones, president of the S. M. Jones Company, has extended a cordial standing invitation to all oil men to come and see how Jones sucker rods are made. The visitor will be well repaid for a few minutes trip through this modern plant.

WESTERN AGENT APPOINTED

The Oil Conservation Engineering Company of Cleveland has appointed as their Rocky Mountain agents the General Engineering Company with headquarters at Casper, Wyoming to cover the territory of Colorado, Wyoming and Montana for Oceco equipment.

Fort Worth, Texas, Jan. 7.—D. H. McCluer, 32, an oil operator of Fort Worth, who was accidentally asphyxiated by a leaky gas stove in his room at a hotel in Mineral Wells, Texas, on New Years Day, was buried here January 3. McCluer was a member of the drilling firm of E. H. Scott & McCluer, which has operated for a number of years in the Brazos field section of Palo Pinto County, Texas.

Wichita Falls, Texas, Jan. 7.—Harry A. Mattaeus, 29, manager for the United Drilling Company, died here December 30 following a short illness. The body was shipped to Mount Vernon, New York, for burial, accompanied by the widow, one son and a brother.

Chain Belt Company Opens Branch Offices on Coast

Milwaukee, Wis., Jan. 10.—Direct factory branches and warehouses have been established in San Francisco and in Los Angeles by the Chain Belt Company of Milwaukee, Wisconsin, manufacturers of Rex chains, transmission machinery and conveying equipment.

The San Francisco office is located at 82 Natoma Street with G. E. Taylor in charge as district manager.

The Los Angeles branch is located at 210 So. San Pedro street with J. V. McDonald as district manager.

With these two direct factory branches, and the establishing just recently of similar branches and warehouse stocks in Spokane, Seattle and Portland, the Chain Belt Company are in a position to assure complete service on products of our manufacture to the Pacific Coast trade.

MILBURN COMPANY BOOKLETS

The Milburn Light, and Milburn Welding and Cutting Apparatus, two pamphlets issued by Alexander Milburn Company, 1416-1428 W. Baltimore Street, Baltimore, Maryland, are ready for distribution.

These pamphlets give complete descriptions of Milburn lighting equipment and apparatus for cutting and welding. Many cuts are used and each pamphlet is well illustrated. Copies may be had upon application to the company.

Continental Supply Will Distribute Gardner Pumps

Tulsa, Okla., Jan. 10.—According to an announcement just issued, arrangements have been completed whereby The Continental Supply Company becomes sole distributor to the oil industry of Gardner oil industry pumps.

The Gardner Governor Company makes a complete line of pumps for oil industry use, including slush pumps for rotary drilling, pipe line pumps for low and high pressures, boiler feed and tank pumps, blender pumps for refineries, etc.

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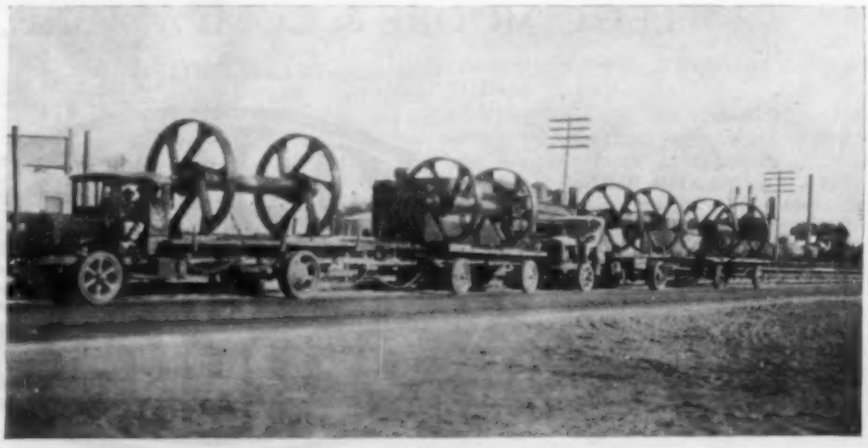
Gardner pumps will be handled through all of the more than 70 stores of The Continental Supply Company.

SPECIAL BULLETIN ON RODS

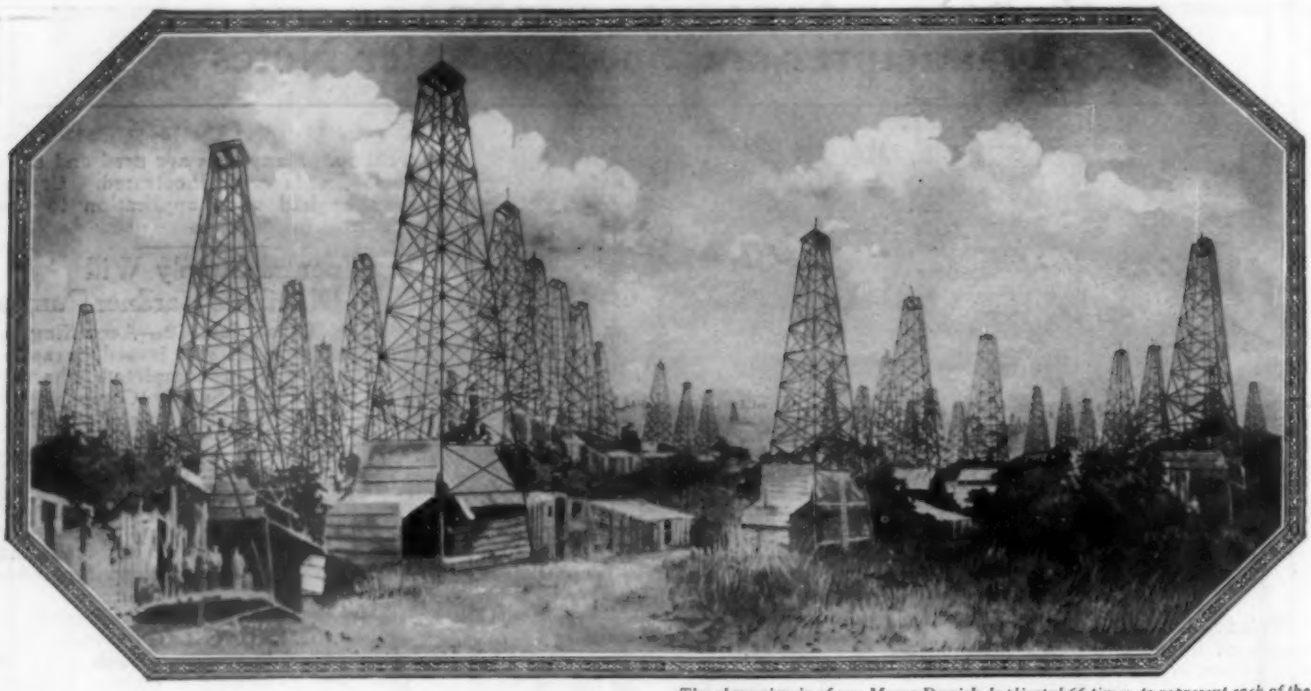
Pumps and rods, and heavy duty lathes are featured in two bulletins recently published by the Axelson Machine Company.

The bulletin devoted to pumps and rods shows the smaller Axelson pumps and rods in actual size. This is a distinctive feature of the bulletin; one side is devoted to descriptive matter, and the other is given over to cuts of the pump and rods. These cuts show the equipment in great detail in exact size in which manufactured. Special points of construction are clearly shown.

Axelson heavy duty lathes are described in the other bulletin. Top, side, sectional, and part views are included, that show the lathes in minute detail. Charts are given that show specifications and sizes of the machines. Further information may be secured by communicating with Axelson Machine Company, Postoffice box 316, Los Angeles, California.



A load of steel bull wheels en route to the California oil fields from the Emsco Steel Products Co.



The above view is of one Moore Derrick duplicated 66 times, to represent each of the 66 wells it has drilled for its owners, the Ebenezer Oil & Gas Co., Wellsville, N.Y.

How One MOORE Derrick Saved $25,000

ONCE upon a time an oil operator was about to drill a well. A salesman knocked at his door and was admitted. He was a bold salesman, for he attempted to persuade the oil man to buy a derrick of steel. Everybody who knew anything about drilling wells, said it was a crazy idea to use a steel derrick. Moreover, the price was high—nearly double the price of a wood derrick.

But this oil man had a bold and venturesome spirit. So he bought the steel derrick. Since that time, this same derrick has drilled 66 wells and it is still in use. The total repair cost has been less than twenty dollars. So the derrick cost per well has been less than ten dollars, saving several hundred dollars per well, compared with a wood derrick.

Roughly estimated, the total saving for the 66 wells must have been from $20,000 to $30,000. If present lumber and labor costs continue, the future saving, with such a record, would be more like $50,000.

Everybody will admit a wood derrick has some good features. For instance, you can drive a nail anywhere and hang your hat on it. But weigh its ultimate cost against that of a steel derrick, and you will be forced to admit that you are paying too much for the luxury of using wood derricks for drilling, pumping and casing pulling operations.

LEE C. MOORE & COMPANY, Inc., Pittsburgh, Pa.

ESTABLISHED 1907

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MOORE TUBULAR STEEL DERRICKS

California Representatives

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3354 East Slauson Avenue
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SAN FRANCISCO ADDRESS
485 California Street

NEW EQUIPMENT, CATALOGS, BULLETINS, BOOKS

Guiberson Company Has New Underreamer Out

The Guiberson Corporation of Dallas, Texas, makers of the Guiberson tubing catcher, spiral bottom water plugs and packers, swab, tool joint tong, etc., have now introduced a new underreamer.

The new underreamer was invented and patented by G. A. Montgomery after years of personal field experience in building and repairing underreamers, and has been tried out for an entire year before being formally announced as an addition to the Guiberson line of oil field specialties.

An exceptional degree of strength is claimed for the new underreamer: cutters are large, thick and sturdy, with wide cutting edges, and each cutter seats in three separate places, over 60 per cent of the cross sectional area of the body being bearing surface for the cutters.

Cutters are fitted into the head in such a way that the reaming blow places no strain on the mandrel, spring or bolt. The entire strain is on the metal in the cutters and body, which can withstand the heaviest duty. The mandrel is forged of chrome vanadium steel, so that it may be depended on not to break and make it possible for the internal parts to be pulled out and lost in the hole.

Special Dressing Form

A patented adjunct in connection with the new underreamer is a special dressing form which permits the operator to dress the underreamer cutters accurately to gauge with the minimum of time and labor.

CARNEGIE SHAPE BOOK READY

The ninth edition of the Shape Book, published by Carnegie Steel Company, is now off the press and available to users of steel.

The new edition is the result of a thorough check and revision of all the sections rolled by Carnegie Steel Company on its shape, rail, bar and plate mills, and while no important changes have been made in the regular sizes of structural and bar mill sizes of beams, channels, angles, tees and zees, a number of changes have been made in the large number of special sections rolled by that company, such as concrete reinforcement bars, window and casement sections, automobile rim sections and other miscellaneous bar mill sections.

Statistical Number of Oil Weekly to Be Issued Soon

The Annual Statistical Issue of The OIL WEEKLY, which will review the developments in all of the oil producing states of the United States, and which will, in addition, devote considerable space to the various sections where prospects for new oil in 1924 are best, will be out on January 19.

This issue will have an unusual value to the person who desires an accurate and complete set of figures showing the completions, failures, initial production, total production, etc., in the various fields of the country. Its review of foreign operations also will prove unusually valuable.

Special copies of this issue can be had by ordering them from The OIL WEEKLY, Box 1307, Houston, Texas. The price is 50 cents per copy.

Ratigan New Sucker Rod Hook Promotes Safety

The idea of "safety first" in the oil fields, even as to some of the smaller pieces of equipment, is taking hold in California. Every effort possible is being made to prevent accidents, and when J. P. Ratigan of Los Angeles placed on the market a safety sucker rod that can be guided and operated easily with one hand, the trade welcomed the new piece of equipment.

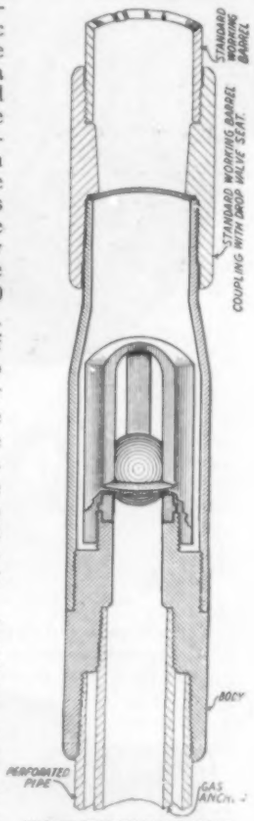
The accompanying cut gives a good idea of the appearance of the sucker rod hook, showing the latch that stays "put" until released. The new hook has been tested to 50,000 pounds with no evidence of strain and it weighs only 33 pounds. Mr. Ratigan is also now making a safety hook to handle tubing with a total weight of 125 pounds and tested to stand a strain of 100,000 pounds.

It will be noted that the hook is ball bearing. The latch is handled with ease and the hook can be connected or disconnected in record time. When connected, there is no danger of it becoming loose and causing an injury.

W-K-M Company Offers New Standing Valve

The W-K-M Company of Houston, Texas, is introducing on oversize standing valve on which patents are pending and which has many features of unusual interest to the oil producer.

This oversize hydraulic standing valve is fitted with a larger ball and seat than the valves heretofore used on the same size of tubing. This increases the fluid capacity through the valve from 50 to 60 per cent. The design of the valve also gives longer travel to the ball and there is an unusually large space for the fluid to flow around the ball into the working barrel.



W-K-M OVERSIZE HYDRAULIC STANDING VALVE
PAT PEND

Another feature which is of advantage is that a much larger gas anchor can be used with the W-K-M oversize standing valves than with other standing valves.

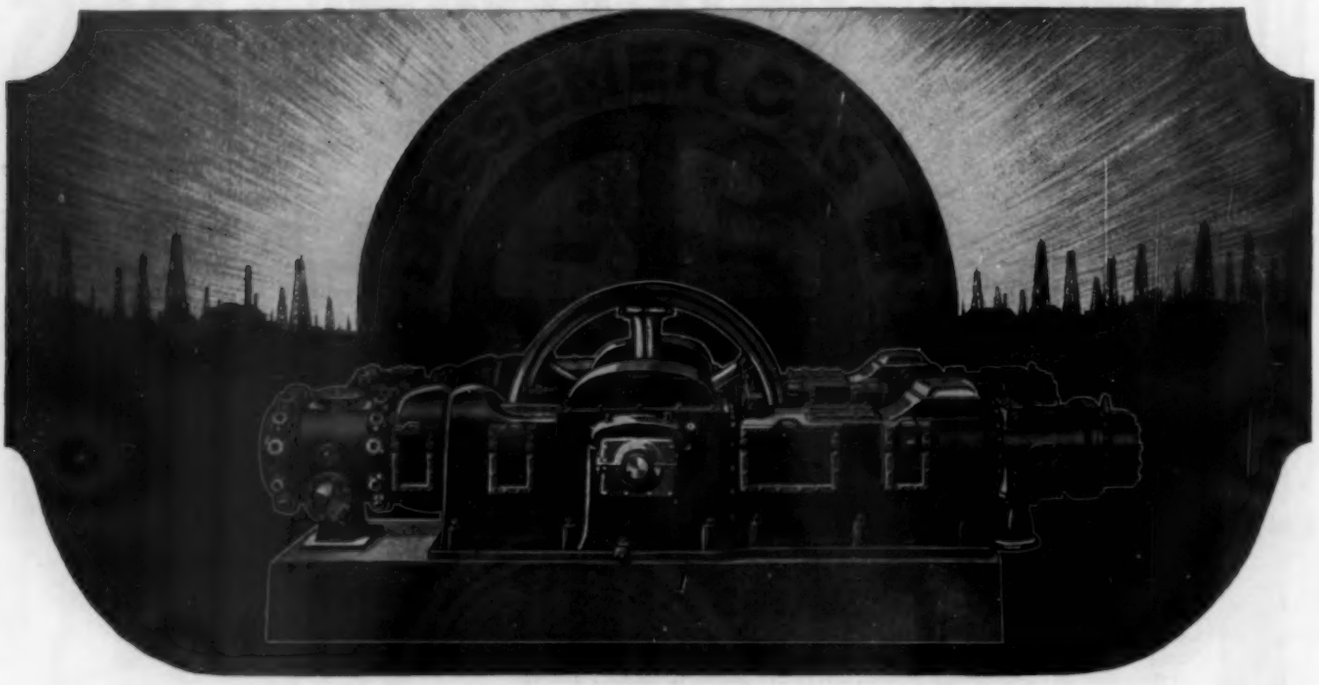
These valves are made either in steel or bronze and fitted either with steel balls and seats or bronze balls and seats, or any combination to meet the local requirements of the user.

ROTARY PUMP BULLETIN OUT

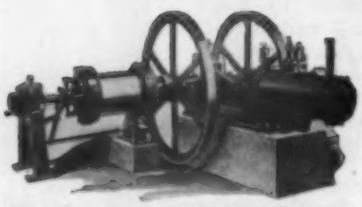
Bulletin 201, published by the Adams Rotary Pump Company, Union Building, Cleveland, Ohio, gives a complete description of "Romeco" Rotary Pumps.

The "Romeco" pump is designed to meet the demand for a quality pump for moving large volumes of fluid at moderate speeds. The bulletin gives a general description of the pump. It also discusses capacities, vacuum and includes specifications and sizes of Adams Rotary Pumps. Copies can be secured from the company upon application.

The OIL WEEKLY will print on this page data on new oilfield equipment, improvements on old equipment, news of new catalogs, bulletins, etc. This department is handled exclusively by the editorial department and has no connection with the advertising department. Data will be carried on anything which the editorial department thinks of interest to our readers, regardless of whether or not the manufacturer is an advertiser in The OIL WEEKLY.—Publisher.

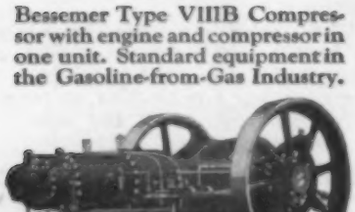


Type Ten Bessemer Direct Gas Engine Driven Compressor



The Bessemer Oil Field Engine is the standard of the industry, and will be found in every oil field.

Bessemer Type VIIIB Compressor with engine and compressor in one unit. Standard equipment in the Gasoline-from-Gas Industry.



Industrial and Oil Field service prove the Bessemer Type IV Oil Engine most efficient and economical where gas is not available.

Mere Technical Excellence Is Not Enough

Oil field service is not theoretical—it is a problem of making good under conditions which are not ideal.

An engine that would operate beautifully in a laboratory under expert supervision might easily fail utterly in the field. Not every oil field engineer has the time to make himself into a Professor of Internal Combustion. An oil field engine must be P-R-A-C-T-I-C-A-L.

THE BESSEMER GAS ENGINE COMPANY
62 York Street ∴ ∴ Grove City, Pa.

BESSEMER

BESSEMER OIL FIELD ENGINES – COMPRESSORS VACUUM PUMPS – ROLLER PUMPING POWERS

Say you saw it in The Oil Weekly

Letters of a Coastal Bollweevil

Thibodoux, La., Dec. 30, 1923.
Mr. Paul Peebles,
Houston, Texas,
Dear Paul:

As the time is getting close for the Geologist Convention in Houston, and knowing you will attend, I take this method of asking you to do the ordinary people a favor and read in your report to the convention, the following article on geology, etc. You know, Paul, you geologists in your reports make your terms so deep that to an ordinary man they are not understood. So let me beg of you to do the people a favor and tell them in plain words the real meaning of geology, oil, etc.

I am, as ever,
Your friend,
WILLIAM MIXER.

P. S.—If you want, I can send you a suit of BVD's for a change during the meeting.

Suggestion for a paper to be entitled "A Plain Statement on Geology, by the Great Geologist, Paul Peebles, P. S. G., etc.":

Geology, a mystery word, in this article will be made so plain that a six-year-old school child can understand it. No longer will the people have to hunt up their spelling books to find out the meaning of such words as Cretaceous, Jura Triassic, etc. Just ask little Johnnie and he will tell you. That is if his father is wise and sees that he gets a printed copy of this address.

Mr. President, ladies and Fellow Geologists, I want to claim your indulgence for a few minutes, subject, "Geology Simplified."

As we all know, we are at times forgetful of the majority in our geological discussions. So let us for a moment talk to this majority—the common people.

Geology teaches us the first element to consider is the earth. This we all know, is round and held together by a force called gravity, which is pulling from all points of the sphere toward the center. This naturally causes friction; friction causes heat. The nearer the center of the earth you come the greater the heat will be. This naturally causes the convex curves to jump the center, thereby causing a vacuum, which in turn fills up with shale and in extreme cases with gypsum. This movement would stop at this point if the rays emanating from the broken stratification did not come in contact with the vegetable matter forced therein by the above mentioned vacuum.

So such being the case, the only natural outcome is the gas crosses over into the anticlines, causing a formation called gumbo. The whole process is nothing but an endless chain and as plain as the links thereof. The expansion at the equator and the contraction at the poles keeps there diffrent forces even up, otherwise a link would bust. But this causes an amalgamated reflex motion in the rays of the sun which penetrate certain parts of the earth's surface and causes evaporations, which in turn make our salt domes.

These domes can be easily located if we only watch the violet rays from the moon. They generally penetrate the earth at an angle of 45°. Find this spot; then take the temperature on each side, multiply the highest one by four and divide by seven. This will be the distance from peak of salt dome sw from your base.

In the Paleozoic era, about 18 miles sw of Houston, there was undoubtedly a peach tree, the roots of which went down into the Cenozoic era, causing a violent movement westward. This kept up until checked by the Tertiary system. This explains why we find different kinds of oil in the earth. It is all filtered through a chug water formation, causing a reaction in the forces which naturally causes the sun to set in the west.

The great Torch Light sand found in Big Horn Basin, Wyoming, was made from pine knots being vulcanized after a process known now only by the Mexicans.

Now, my dear people, the above is a short paper on the important parts governing the formation of oil. I advise every man, woman and child to get a copy of The OIL WEEKLY and read what I have said carefully. You may have a salt dome in your back yard and don't know it. This article will tell you how to find it.

N. B. Paul you can copyright the above in your name, otherwise some fellow on the West Coast will claim it. Keep it in Louisiana and Texas. W. M.

Mr. wM mixer, etc.
deer sir:

yore letter 2 hand & contence noted, also the speach which yu rote for me 2 make at the geology meetin in huston in the rice hotel in march, but I will be forsed & compelled 2 refuse 2 use them words for mi speach. I wud not b gilty of sutch thing. I am a honest man even if I am a geologist, an I wud not b gilty of stealin yore brane & lernin an paradin it as mi own. I will haft 2 make me up a speach mi own self.

ennyway I dont no if it will be a good ideer 2 let the cat out of the bag like that. us geologistis, or at leest sum of us, has got pritty good graft out of this biziness & if we let the publick in on it our graft will be runed.

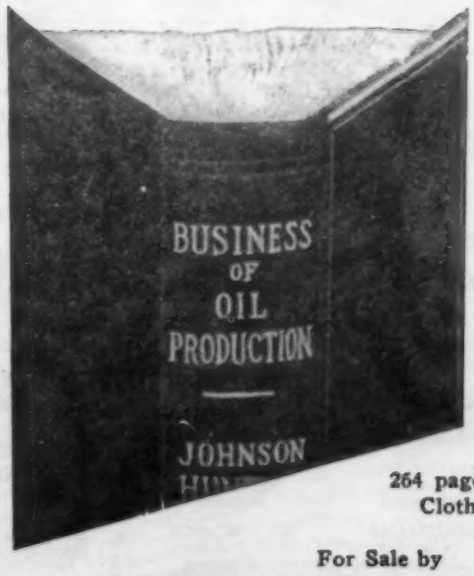
but I will make yu a propersitshun like this, whitch is a fare one. me bein so well noed, I will rite sum moar werds 2 go with what yu hav rit, an we will say it is the rudyments of geology by paul peebles, psg, ote, i, dr., & wilyum mixer, gw., bvdl., an sell it 2 colledges whitch hase geology skules. we can help out the skules that away & we can make them all sine a oath not 2 giv away how simple geology is. I will rite a hole lot of moar words & we can put in a pitcher of the drake wels & a pitcher of the babilonyans bildin the piramids with asfelt for mortar & sum moare pitchers like that & sum of them crisscross lines with crooked lines draweed acrost them, etc., etc & so forth, & make a book big enuff 2 sell for a 1$. Then we will divide the prophets, six bits for eatch book 2 me & the rest after payin for the printin 2 yu. i git the bigger share on akount of me bein so well noed whitch will make the book sell. yu no yorsself if yu was 2 try 2 sell it they wud laff in yore face.

let me no at wunst what yu think about this skeam & I will then find out an let yu no how mutch munny yp will hav 2 put up in advanct 2 git the book printed. I hav thunk about this propersishun reel seerus & I can't see where i can lose anything, an I am rarin 2 go if yu are. I aint doin nuthin rite now, an will hav plenty of time 2 git the printin done & the pitchers.

I am muchablige 2 yu about the bvds but yu seam 2 think that I do not change unawares escept at meetins. I sumtimes change moar oftener than that, an the pare whitch I am now warin is busted in the sw corner an it is cold. yu can send them on now if yu wud jest as well. yores truley,

paul peebles, psg., oet, i, &etc.

p. s. them letters what I put by yore name meens geology riter and bvd lender, an they will look swell in a book & only I & yu will no what they mean. pp



The Business of Oil Production

Johnson-Huntley-Somers

This book describes the principles of Company organization as regards scope, personnel and methods. It was written to meet the urgent, immediate need on the part of many participating in the oil industry, especially the executives of oil companies, for a book on the business of oil and gas production.

264 pages, 6x9, 30 figures
Cloth, $3.50 Postpaid

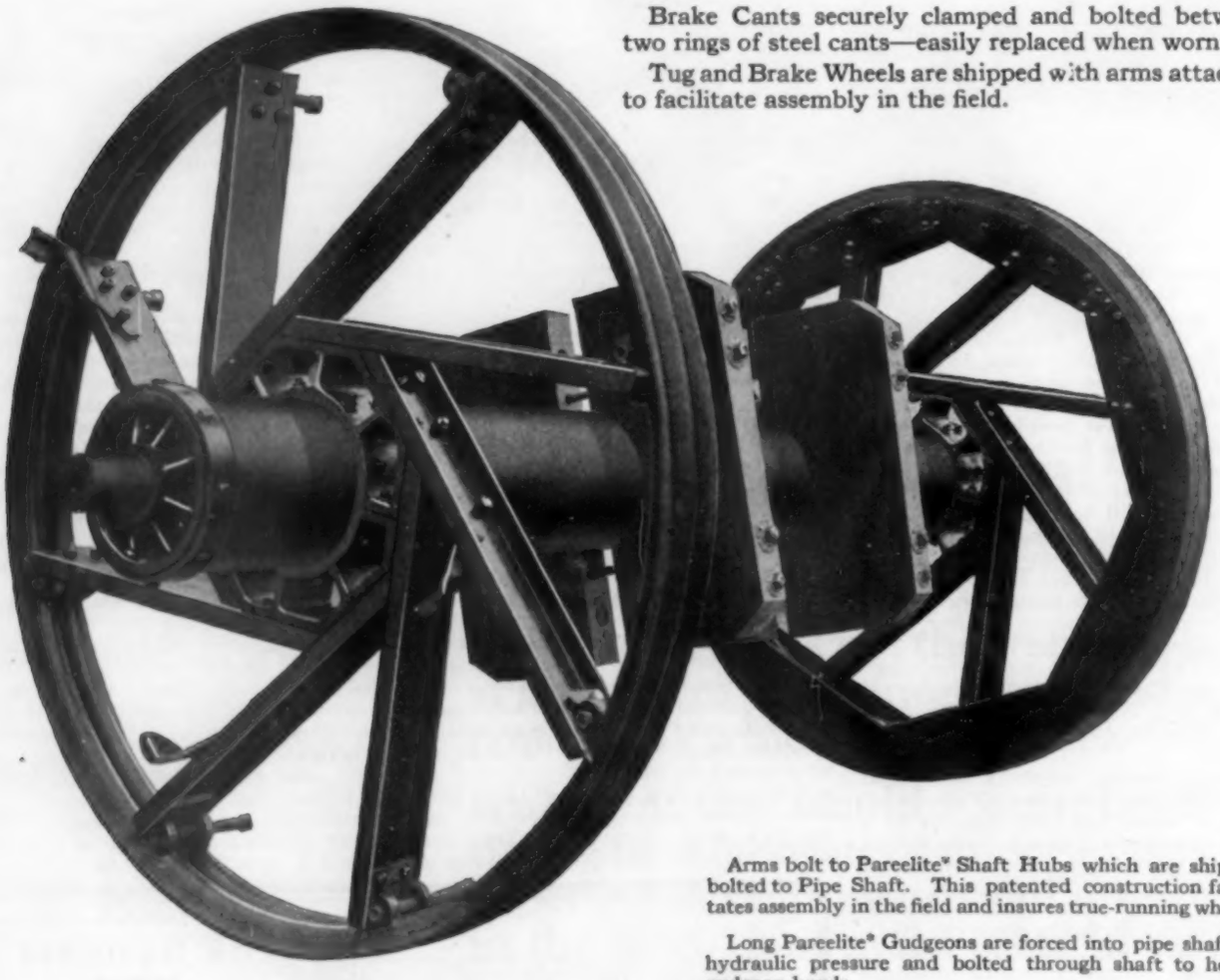
For Sale by
THE GULF PUBLISHING COMPANY
P. O. Box 1307, Houston, Texas

PARKERSBURG
METAL TUG
STEEL BULL WHEELS

"V"-Grooved Pareelite* Tug Rim affords positive traction.

Brake Cants securely clamped and bolted between two rings of steel cants—easily replaced when worn.

Tug and Brake Wheels are shipped with arms attached to facilitate assembly in the field.



Arms bolt to Pareelite* Shaft Hubs which are shipped bolted to Pipe Shaft. This patented construction facilitates assembly in the field and insures true-running wheels.

Long Pareelite* Gudgeons are forced into pipe shaft by hydraulic pressure and bolted through shaft to heavy gudgeon bands.

*Pareelite is a "High Manganese" metal—not cast iron—that will sustain a load of 4,320 pounds on arbitration test bar of American Society for Testing Materials, and with only 7/64 inch deflection at breaking point. It has an ultimate tensile strength of 33,680 pounds per square inch.

Parkersburg Metal Tug Steel Bull Wheels are made with standard length shafts and for 9-inch or 12-inch Brake Irons

Ask for detailed information

The PARKERSBURG RIG & REEL CO.

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MONTANA
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*District Offices ‡Frick-Reid Supply Co. †Continental Supply Co.

SQUEAKS from the BULL WHEEL

Charlie Loses Control Again

It does seem like that after a hitch in the Marine Corps, under tutelage of the nation's best instructors in the use of firearms, and several narrow escapes while out hunting for and shooting at birds, fence posts road signs, etc., that any ordinary person would know that when the right kind of a shell is put in the right kind of a gun and the trigger is pulled there is something going to happen. But all this together with a court martial for such an offense means nothing in the young life of Charlie Richard of the Humble's production department, for just last week while cleaning an old rifle he had traded all his marbles, a pocket knife and an air gun for, he through force of habit, we guess, just had to put a shell in it and see what would happen if he pulled the trigger. We don't know just how long after this it was before Charlie could talk, but we do know that there is a hole in the tile wall in the bath room, through the floor upstairs and the roof. Charlie won't tell us what the Mrs. has said about cleaning guns in the house but we are drawing on our imagination for this, you can do the same.

Stranger: "Rastus, do the people who live across the road from you keep chickens?"

Rastus: "Dey keeps some of 'em, sah."

Wrong Party

The doctor's family was at dinner one evening when the phone rang. The doctor answered. Turning to his wife, he cried in alarm: "Quick, get my satchel. A man in a dying voice says he can not live without me."

"Wait," said the wife, who picked up the receiver, "that call is for Edith."

Knee Deep

A construction gang was working on a section of railroad where the mud was excessively deep. The boss was resting in a shanty when suddenly he heard a workman shout:

"Queek, queek, bringa da pick, bringa da shov, Antonio stuck in da mud!"

And the boss, making a megaphone of his hands, shouted back:

"How far in?"

"Up to hees knees."

"Well, then, let him walk out," the boss replied disgustedly.

"Oh, but he can no walk, he wronga end up!"—Exchange.

Talented Actors

A widower was to be married for the third time, and his bride had herself been married once before.

The groom-elect had printed across the bottom of the wedding invitation sent to his particular friends:

"Be sure to come; this is no amateur performance." — (Le Rire, Paris.)

"Willie," asked the teacher, "what was it Sir Walter Raleigh said when he placed his cloak on the muddy road for the beautiful queen to walk over?"

Willie, the ultra-modern, gazed about the classroom in dismay, and then taking a long chance, replied:

" 'Step on it, kid!' "

Mr. Tooter: "Do you often ever change your environment?"

Mr. Booter: "Shure an' I do; ivry Sattiday night."

The four-year-old said to his father: "Daddy, I think I'se very ill."

"What's the matter?" asked his father.

"I'se full of beg pardons, daddy," he replied as he put up his hand to his mouth.

The Family Menagerie

"Everybody in our family is some kind of an animal," remarked Tommy.

"What do you mean?" remarked his mother.

"Why, mother, you're a 'dear,' you know."

"Yes, Tommy, and the baby is mother's little lamb."

"I'm the kid; sister is some chicken; aunt is a cat and Cousin Kate is a bird; and Uncle Jim is an ass; and little brother's a pig; Dad's the goat, and—."

"That is enough, Thomas."

Heard at the Ritz

"Oh, yes, you Americans are all right, but I just cawn't grasp your slang. To show you what I mean, old frolic: that fellow sitting next to me at dinner, the silly ass, made some blasted reference to a 'cat's ankle.' Now what the devil did he mean? He also talked about the same cat's nightgown. I simply couldn't grawsp it, you know, so I seized the first opportunity to shed him and shoved off. Of course, you don't notice the blighted stuff, because you hear it every bloody day. Just the same, work the old bean a little and see if you can understand why I hate so blasted much to hear the jolly old king's English murdered so. Well, pip, pip."

At night when sudden tremors
shake,
And agitate the casement,
The cause may be a distant
quake
Or raisins in the basement.

"I don't think it's good taste for me to wear much jewelry. You know fathers' a jeweler."

"The principle's right. My father's a clothier."—Puppett.

Fussy Passenger (on board steamship): "Doesn't this boat tip a lot, steward?"

Steward: "Yes, she's setting a good example to the passengers. Thank you, sir."—Jack-o'-Lantern.

Recently a Pullman porter was called "on the carpet" for failure to use sufficient tact in enforcing the regulations of the company. Superintendent W. M. Camp, in order to ascertain if he had any conception of the meaning of the word, asked him if he could give a definition of tact. He came through with the following: "Tact is something if a man ain't got you misses it, but if he is got it you never notices it."—Pullman news.

The Rev. George Lincoln Jackson, colored, was imploring the Lord for a clean church.

"Oh, Lawd," he prayed, "we wants sin rousted out'n dis church! We wan's you to cur-TAIL de ol' debbil!"

"Yes, Lawd," echoed a happy brother from the "amen" corner, "We wants you to cut it smack off shawt!"

Rabbit, an old darkey, had been working at Mr. Jones' lumber yard long enough to feel himself a privileged character.

One day, help being scarce, Mr. Jones was assisting at the unloading of a car of lumber when a plank, thrown off, narrowly escaped hitting him. Rabbit called out to the careless colored boy: "Look out there, don't you kill the boss man; he's my pocketbook."

"Ticket," said the conductor politely. The intoxicated passenger did not reply.

"Where is your ticket?" the conductor demanded loudly.

"I ain't got no ticket," came the drowsy, indifferent answer.

"Where do you want to go?" asked the public official.

"I want to go to hell."

The conductor made no more efforts at patience. "Young man," he ordered, "you give me one dollar and forty-two cents and get off at Greenville."

Since the Days of SPINDLE TOP

Many of the old time drillers remember the hectic days of Spindle Top—the pioneer days of the Oil Industry in Texas.

That was almost a quarter of a century ago. The American Well & Prospecting Co., of Corsicana, Texas, was manufacturing oil field equipment and supplies even at that early date.

As the years passed, conditions brought about many changes in the needs of the oil producer. Lessons were learned by experience. Throughout this period "Gumbo Buster" products have maintained a place in the foreground.

Gumbo Buster Products ARE DEPENDABLE. They are the result of time, experience and science. They have proven themselves by 25 years of service.

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Distributors
Texas -:- Louisiana -:- Arkansas -:- Oklahoma

'GUMBO BUSTER' PRODUCTS

Rotary
Draw Works
Pump
Drilling Engine
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Oil Well Supply Co.
Republic Supply Company
Titusville Iron Works Co.
United Iron Works, Inc.
See Oil Field Supplies and Tanks

Blowout Preventer—
Cameron Iron Works

Burners—
Gaso Pump & Burner Mfg. Co.
Norris Bros.

Bull Wheels—
International Derrick & Equipment Co.
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Republic Supply Company
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Gulf Coast Machine & Supply Co.
The National Supply Cos.
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Republic Supply Company
W-K-M Co.

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W-K-M Co.

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Hope Engineering Co.
Sullivan Machinery Co.
United Iron Works, Inc.

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Continental Supply Co.
The National Supply Cos.
Republic Supply Company

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Gulf Coast Machine & Supply Co.
International Derrick & Equipment Co.
Lufkin Foundry & Machine Co.
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Oil Well Supply Co.
Parkersburg Rig & Reel Co.
Superior Tube Co.

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Superior Tube Co.

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Republic Supply Company
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Oil City Iron Works, Inc.
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Republic Supply Company
Reading Iron Co.
Standard Seamless Tube Co.
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Oil City Iron Works
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Western Machinery Co.

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Packing—
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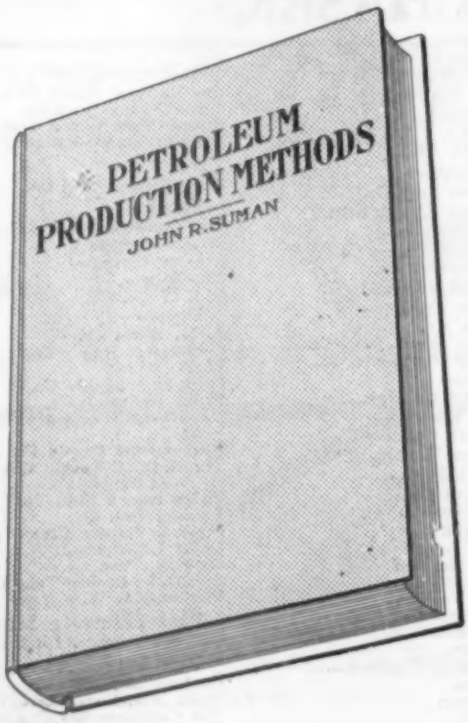

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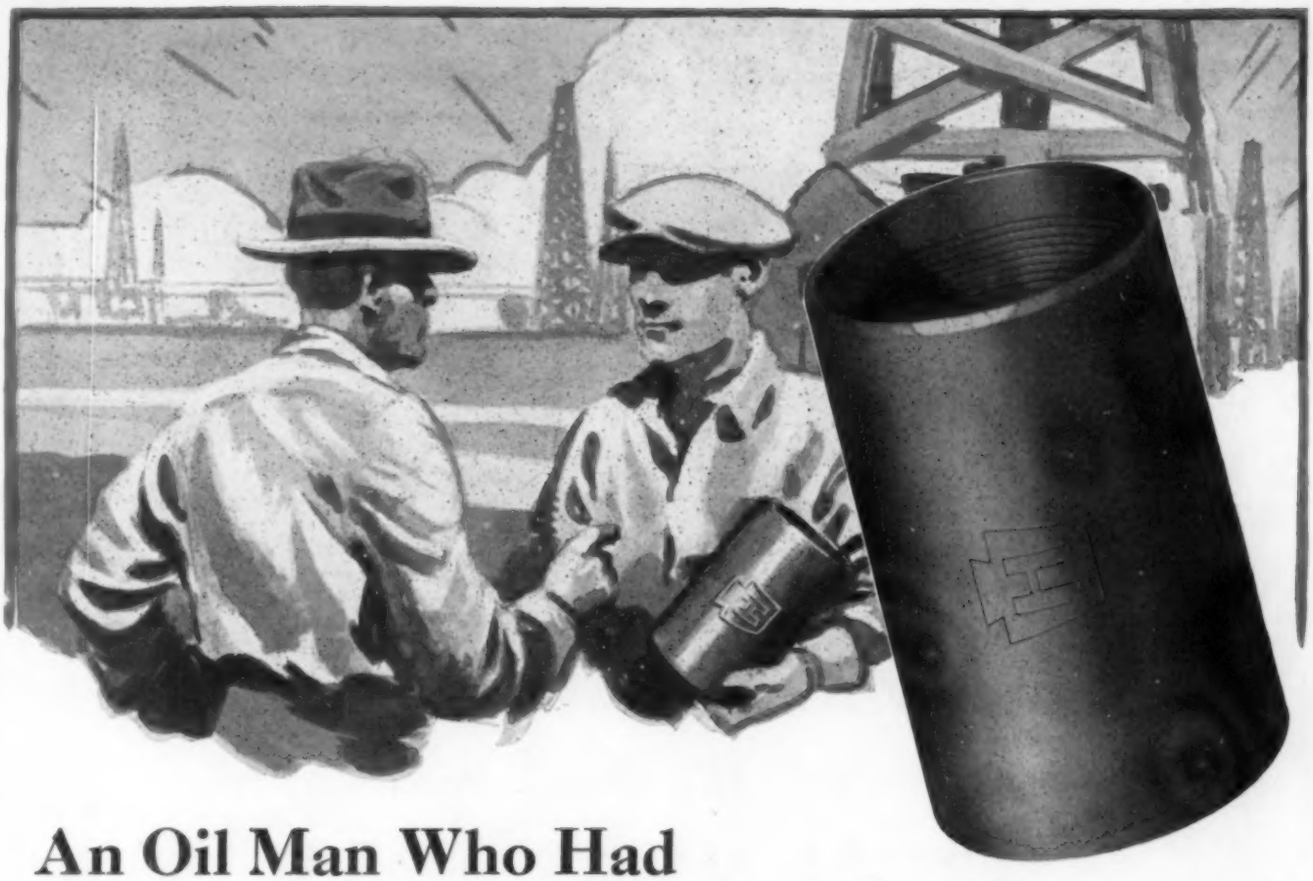

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